VadaTech VT85x (0, 1, 2, 3, 5, 6 series)

User Manual

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vadatech inc

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Revision History

Doc Rev	Description of Change	Revision Date
1.0	Document Created	09/20/2010
1.1	Add VT855 and VT856 Add instructions for replacing air filter and fan trays.	01/27/2011

Table of Contents

Figures

Tables

1 Overview

The VT85x series are 1U MicroTCA carriers offering a variety of chassis. Current production comprises VT85x models x=[0 1 2 3 5 6]. This document describes the common VT85x chassis, configuration and operation. Attached Appendices describe each model's individual characteristics with configuration and operational characteristics. Table 1 provides a comparison chart for each model's features.

Model	# of MCH	JSM	Telco Alarm	# of AMC MH Slots	Dual Redundant Fan Tray	Airflow Direction	Power Supply Option	Power Supply Redundancy
VT850	1	Yes	Yes	12	Yes	R -> L	AC/DC	Yes
VT851	1	Yes	Yes	12	Yes	R -> L	AC/DC	Yes
VT852	1	Yes	Yes	6	Yes	R -> L	AC/DC	No
VT853	1	Yes	Yes	6	Yes	F -> B	DC	No
VT855	1	No	Yes	2	No	F -> B	AC/DC	No
VT856	1	No	Yes	2	No	F -> B	AC/DC	No

Table 1: Model Comparison Chart

1.1 Document References

- PICMG Specification MTCA.0 R1.0 (MicroTCA)
- VadaTech VT850 data sheet
- VadaTech VT851 data sheet
- VadaTech VT852 data sheet
- VadaTech VT853 data sheet
- VadaTech MicroTCA MCH Getting Started Guide
- VadaTech MicroTCA Shelf Command Line Interface Reference Manual
- VadaTech MicroTCA Carrier Command Line Interface Reference Manual
- VadaTech MicroTCA Management Interface Specification
- VadaTech MicroTCA Carrier SNMP Interface Reference Manual
- VadaTech MicroTCA Shelf SNMP Interface Reference Manual
- VadaTech MicroTCA PM Command Line Interface Reference Manual

1.2 Acronyms Used in this Document

Acronym	Description
AMC	Advanced Mezzanine Card
CU	Cooling Unit
JTAG	Joint Test Action Group
JSM	JTAG Switch Module
MCH	MicroTCA Carrier Hub
PEM	Power Entry Module (hot-swappable power supply)
PM	Power Module

Table 2: Acronyms

2 Components

The VT85x carrier's components include an on-board MCH, single or double power supply options, two Cooling Units, temp sensors, as well as built-in JTAG Switch Module (JSM) and Telco Alarm Interface capabilities.

2.1 Power Supply

Table 1 shows the VT85X power supply ordering options.

2.2 Cooling Units

The VT85X carriers include two redundant MicroTCA Cooling Units (CUs). The name and position depends on the airflow direction.

A chassis air filter is located on the intake air path and will be described individually for each Model.

2.2.1 Air Filter Replacement

The chassis air filter must be replaced if dust has accumulated in the filter, reducing the cooling capacity of the chassis. The air filter may be replaced during normal chassis operation. Note that with the NEBS option, the fans will be turned off when the old air filter is removed, so you must replace the air filter quickly to prevent AMCs from overheating. The air filter is held in place by a single captive screw. Loosen the screw, then pull on the air filter to remove it from the chassis. Put the new air filter into the chassis, then firmly hand-tighten the screw.

2.2.2 Fan Tray Replacement

A fan tray must be replaced if any of its fans fail. Fan trays may also be replaced if quieter or more efficient fans become available. Fan trays may be replaced during chassis operation, with two limitations. First, do not touch the fan blades when taking the fan tray out of the chassis. Second, put the new fan tray into the chassis quickly to prevent overheating.

Figure 1: Fan Tray Extraction

There are two mechanisms for holding fan trays in place. The first mechanism, used on all chassis, uses a captive screw with a retention tab. Normally, the tab is pointing downward. Loosen the screw until the tab points to the right, as shown in Figure 1. Then pull on the screw to take the fan tray out of the chassis. To put a new fan tray into the chassis, make sure the tab is pointing to the right. Push the fan tray firmly into the chassis, then firmly hand-tighten the screw. The tab should be pointing down.

The second mechanism, used for rear fan trays on some chassis, is a pair of captive screws. To remove the fan tray, loosen the screws and pull on the fan tray. Push the new fan tray into the chassis and firmly hand-tighten the screws.

2.3 MicroTCA Carrier Hub

These carriers include an integrated MCH. The MCH acts as both the Shelf Manager and Carrier Manager. Access to this MCH is provided by either a removable module or via front panel, depending on model (See Appendix for model-specific information).

2.4 Chassis Sensors

Chassis sensors available on the VT85x series are monitored by the Carrier Manager running on an MCH. The sensors available are as follows:

2.4.1 Temperature

Temperature sensors are incorporated in the Cooling Units and MCH to monitor operating conditions. The temperature sensors provided by the Cooling Units will be described individually for each Model.

The temperature sensors on the MCH:

1. MCH TEMP1 – distributed on MCH
2. MCH TEMP2 – distributed on MCH
3. MCH DAC TEMP1- distributed on the MCH daughter card
4. MCH DAC TEMP2- distributed on the MCH daughter card

MCH software sets operating conditions for the temperature sensors:

- Lower Non Recoverable -10 C
- Lower Critical 0 C
- Lower Non Critical 5 C
- Upper Non Critical 55 C
- Upper Critical 65 C
- Upper Non Recoverable 75 C

2.4.2 Filter Present

A chassis sensor detects the absence/presence of the intake air filter.

2.4.3 Telco Active Sensor

One Cooling Unit manages the Telco Alarm and the Telco Active Sensor is used to determine which Cooling Unit is in control.

2.4.4 Power Switch Sensor

The Cooling Unit controlling the Telco Alarm monitors the Chassis Power Switch.

2.5 Telco Alarm

All VT85x chassis offer Telco alarm functionality to provide the end user with information concerning operational anomalies detected. (See Appendix for model-specific information.)

2.5.1 Telco Alarm Connector

This connector is identical throughout the VT85x series and is used to drive an external alarm device. Its location in the chassis depends on the model. (See Appendix for model-specific information.)

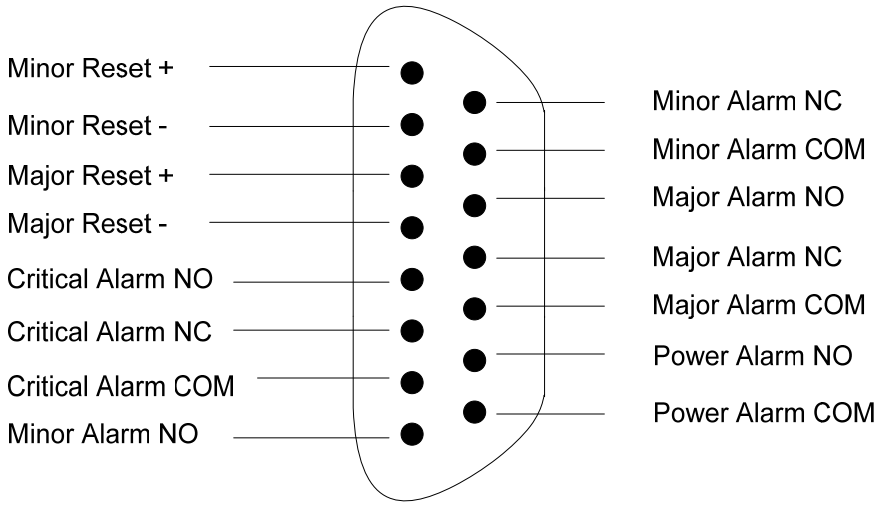

Figure 2: Telco Alarm Connector

Name	Description
Minor Reset +	minor alarm reset, positive polarity
Minor Reset -	minor alarm reset, negative polarity
Major Reset +	major alarm reset, positive polarity
Major Reset -	major alarm reset, negative polarity
Critical Alarm NO	critical alarm relay, normally open
Critical Alarm NC	critical alarm relay, normally closed
Critical Alarm COM	critical alarm relay, common path
Minor Alarm NO	minor alarm relay, normally open
Minor Alarm NC	minor alarm relay, normally closed
Minor Alarm COM	minor alarm relay, common path
Major Alarm NO	major alarm relay, normally open
Major Alarm NC	major alarm relay, normally closed
Major Alarm COM	major alarm relay, common path
Power Alarm NO	power alarm relay, normally open
Power Alarm COM	power alarm relay, common path

Table 3: Telco Alarm Pinout

2.6 FRU Information and Carrier Locator

FRU information describes the carrier backplane topology to the chassis MCH controllers. The information is typically held in an EEPROM attached to the chassis Telco board or attached to the chassis backplane. (See Appendix for model-specific information.)

The Carrier Locator can be assigned via mechanical dip switches located either via front or rear panel. (See Appendix for model-specific information and switch settings Table.)

The Carrier FRU information is stored in the EEPROM at address 0x52

2.7 Clock Options

The VT85x series route Fabric Clock (FCLK) directly from the clock generator to each AMC slot. TCLKA, TCLKB, TCLKC, and TCLKD are routed to an on board FPGA for clock routing and configuration.

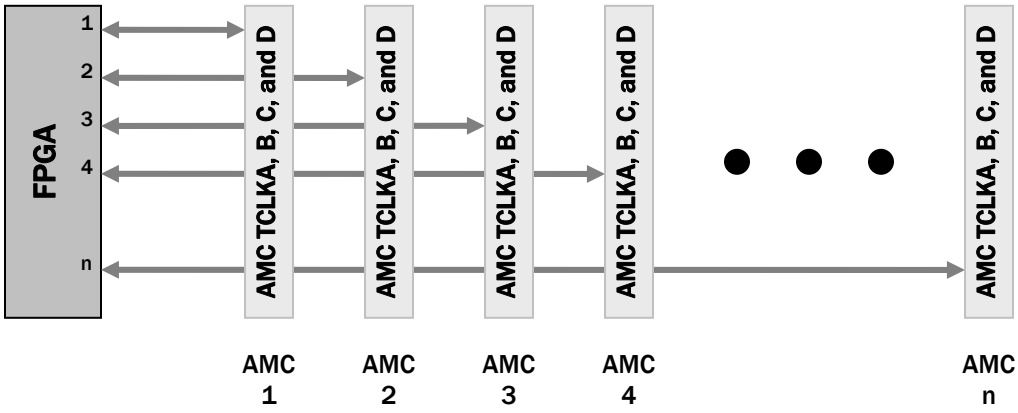

Figure 3: VT85x Telco/GPS clock topology.

2.8 Backplane Topology

Common VT85x midplane connectivity is shown here. Check model-specific information in the Appendix.

2.8.1 IPMB Busses

The VT85x provides radial IPMB-L connected to all AMCs as shown in **Figure 4**.

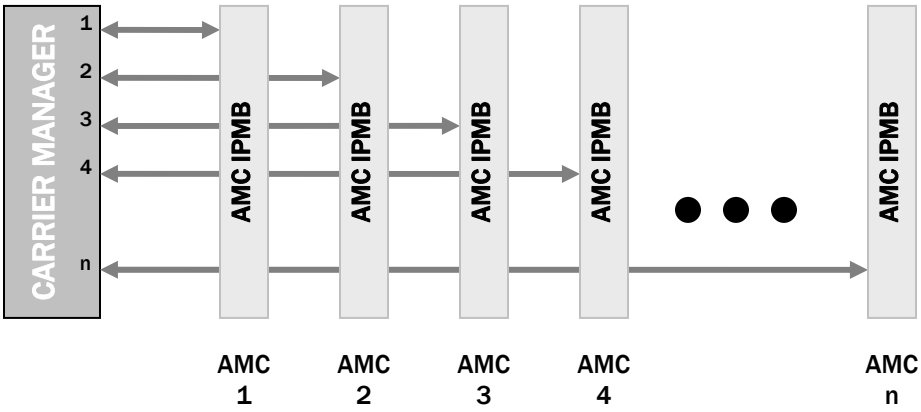

Figure 4: VT85x AMC I2C bus topology.

2.8.2 Ports 0 and 1

The on-board GbE Fabric routes Port 0 and 1 of each AMC **Figure 5**.

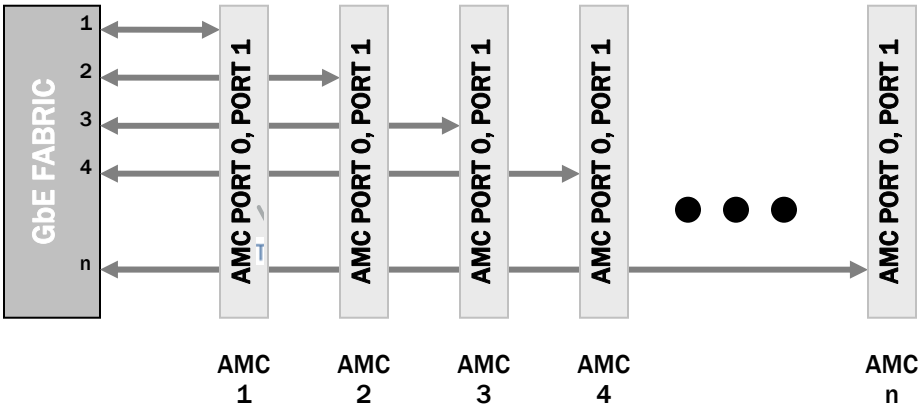

Figure 5: VT85x AMC Port 0 and 1 Topology.

2.8.3 Ports 2 and 3

AMC ports 2 and 3 (SAS / SATA) are routed amongst AMC slots depending on model (see Appendix for model-specific information).

2.8.4 Ports 4 – 7 and 8 – 11

In the fat pipes region, Fabrics D, E, F, and G are connected to ports 4, 5, 6, and 7, respectively, on all AMCs as shown on **Figure 6**.

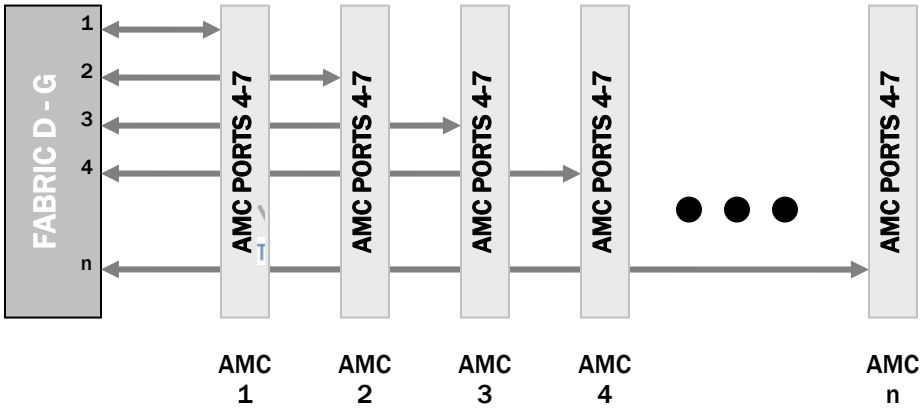

Figure 6: VT85x AMC Ports 4-7 Topology.

Ports 8 – 11 are available depending on model and ordering option (see Appendix for model-specific information).

2.9 Carrier Number Configuration

If multiple Carriers are configured with an external Shelf Manager, make sure that each Carrier has a unique Carrier number. To set the Carrier number, set the Chassis Locator switch (location depends on model, see appendix for model-related information) according to Table 4. The Carrier number can also be set through the Carrier Manager CLI `set_carrier_number` command. The Carrier Number set through the CLI takes precedence over the Carrier number set in the Chassis Locator switch.

Carrier Number	Switch 1	Switch 2	Switch 3	Switch 4
1	On	On	On	On
2	On	On	On	Off
3	On	On	Off	On
4	On	On	Off	Off
5	On	Off	On	On
6	On	Off	On	Off
7	On	Off	Off	On
8	On	Off	Off	Off
9	Off	On	On	On
10	Off	On	On	Off
11	Off	On	Off	On
12	Off	On	Off	Off
13	Off	Off	On	On
14	Off	Off	On	Off
15	Off	Off	Off	On
16	Off	Off	Off	Off

Table 4: Carrier Number Configuration

3 Appendices

The Appendices contain model-specific information for each product followed by configuration information and tables.

- Appendix 3.1– Model VT850 AND VT851
- Appendix 3.2– Model VT852
- Appendix 3.3– Model VT853
- Appendix 3.4– Model VT855
- Appendix 3.5– Model VT856

3.1 VT850 and VT851

3.1.1 Components

3.1.1.1 Slot Layout

The VT850 and VT851 carriers include a MicroTCA Carrier Hub (MCH), a MicroTCA Power Module (PM) and two MicroTCA Cooling Units (CUs). Two removable modules provide front-panel access to these components. The DA122 provides Ethernet and serial access to the MCH, and Telco Clock functionality. The DA123 provides LEDs and serial access for the PM, Telco Alarm functionality, and a JTAG Switch Module for the AMCs. The slot layout is shown in **Figure 7** and **Figure 8**.

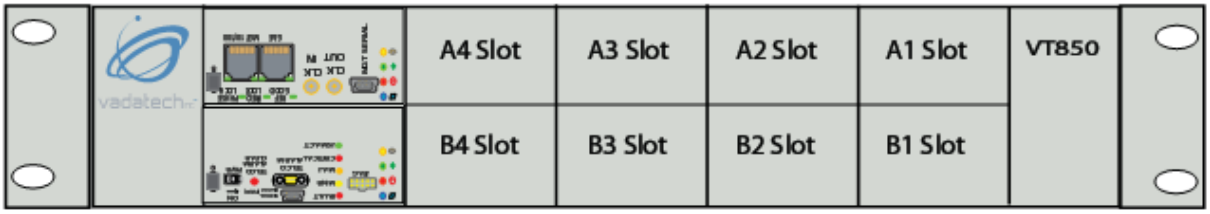

Figure 7: VT850/1 Front Side AMC Slot Layout.

Figure 8: VT850/1 Back Side AMC Slot Layout.

Slot	IPMB-L Address	FRU
A1	0x72	5
B1	0x74	6
A2	0x76	7
B2	0x78	8
A3	0x7A	9
B3	0x7C	10
A4	0x7E	11
B4	0x80	12
A5	0x82	13
B5	0x84	14
A6	0x86	15
B6	0x88	16

Table 5: AMC Slot Numbering

3.1.2 MicroTCA Carrier Hub

Access to this MCH is provided by a removable module, the DA122.

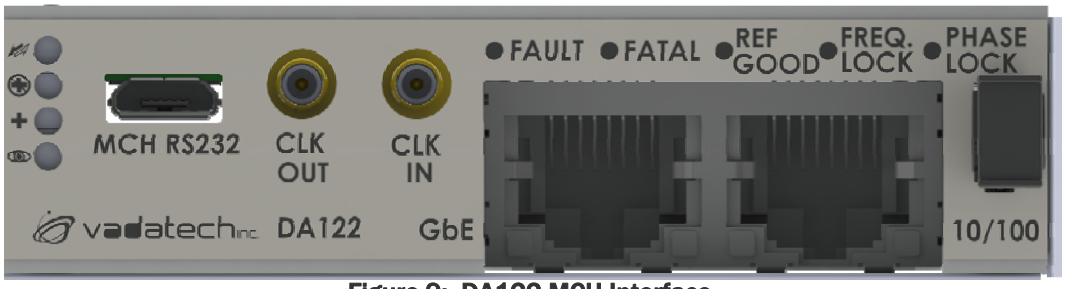

Figure 9: DA122 MCH Interface.

3.1.2.1 ATCA LEDs

The four LEDs to the far left are ATCA-controlled LEDs.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
General Purpose	Amber	Unused

Table 6: Typical MCH LEDs

3.1.2.2 Clock Interface

CLK IN and CLK OUT are the clock signals. REF GOOD, FREQ LOCK, and PHASE LOCK indicate the clock state. Refer to VadaTech UTC001 and VT850 Telco - GPS Clock Configuration Guide for details.

3.1.2.3 Data Interfaces

The MCH RS232 port provides console access to the MCH. The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the carrier, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81). The MGT10/100 provides Ethernet access to the MCH. This MCH supports SSH, RMCP, SNMP and HTTP connections. Refer to the VadaTech MicroTCA manuals listed in section 1.1 for details. The GbE port provides access to the Ethernet fabric switch, which is connected to the AMCs and the MCH.

3.1.2.4 Cooling Units

These carriers include two integrated MicroTCA CUs. Each of these CUs provides the following sensors:

Number	Type	Name	Description
0x10	0x01	VT 85X CU T1	Temperature (LM75)
0x33	0x01	VT 85X CU T2	Temperature (ADT 7462 internal)
0x48	0x04	FAN1 RPM	RPM
0x49	0x04	FAN2 RPM	RPM
0x4A	0x04	FAN3 RPM	RPM
0x4B	0x04	FAN4 RPM	RPM
0x4C	0x04	FAN5 RPM	RPM
0x4D	0x04	FAN6 RPM	RPM
0x4E	0x04	FAN7 RPM	RPM
0x4F	0x04	FAN8 RPM	RPM
0x30	0x01	VT 85X CU T3	Temperature (ADT 7462 external)
0x31	0x01	VT 85X CU T4	Temperature (ADT 7462 external)
0x32	0x01	VT 85X CU T5	Temperature (ADT 7462 external)
0x90	0xF2	VT 85X CU HS	AMC Hot Swap Handle
0x91	0xF1	VT 85X CU IPMB	ATCA IPMB-0 Status

Table 7: Common Cooling Unit Sensors

CU1 provides the Telco function, and supports this additional sensor:

Number	Type	Name	Description
0x3F	0xF4	TELCO ALARM	Telco Alarm Status

Table 8: Cooling Unit 1 Sensors

3.1.2.5 Fan Trays

The VT850/1 carriers are designed for a Right-To-Left airflow and are equipped with removable Fan Trays on both, intake and outtake sides of the chassis.

Each fan tray provides four LEDs and a hot swap button, as shown in Figure 10 (VT850/1 Front Right Fan Tray).

Figure 10: DA210 Front Panel

The Fan Tray LEDs indicate the state of the CU, as described in the following table.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per AMC.0 and MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. BLINKING indicates that one or more fans have stalled, or are still spinning up. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
Upgrade	Amber	ON while the CU operation is interrupted during a firmware upgrade.

Table 9: Typical Fan Tray LEDs

At power-on, the hot swap handle state is Closed. Pushing the Hot Swap button once toggles the handle state to Open. Pushing the Hot Swap button again toggles the handle state to Closed.

Removal of the Fan Tray is done via the captive screw.

3.1.2.6 Carrier Number Configuration

To set the Carrier number, set the Chassis Locator switch (SW2) on the DA122 according to Table 4. The Chassis Locator switch is on the top of the DA122, as shown in Figure 11.

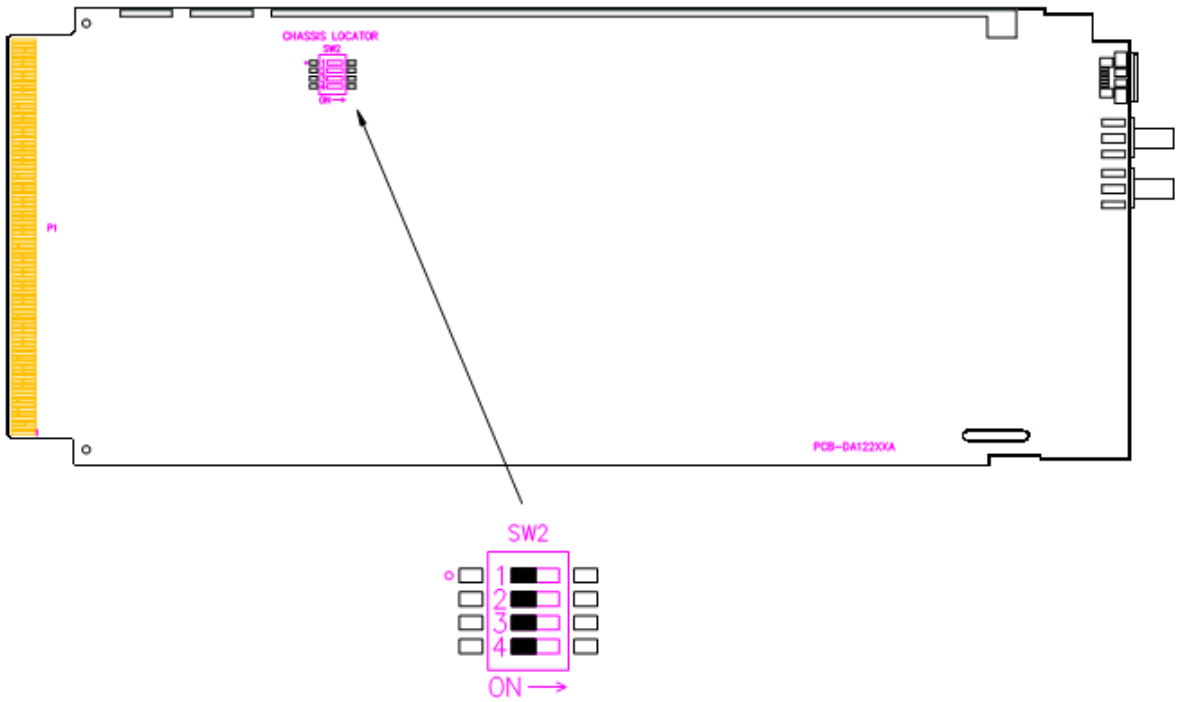

Figure 11: DA122 Chassis Locator Switch

3.1.3 Power Module

These carriers include an integrated MicroTCA PM. The PM gets its power from two hot-swappable power supplies, also called Power Entry Modules or PEMs. The PEM FRU Inventory is read when the power is first turned on to determine the PM power capability. PEMs are hot-swappable, but the new PEM must have the same power capabilities as the one that was removed. PEMs are treated as redundant power feeds. That is, if each PEM provides 650 watts, the power capability reported by the PM is 650 watts, rather than 1300 watts. Access to the PM is provided by the DA123.

Figure 12: DA123 PM, JTAG, and Telco Interface

3.1.3.1 KILL Switch

In order for the system to run, the KILL switch must be in the direction contrary to the arrow (to the left). This switch directly controls the removable power supplies. When the switch is turned off (toggle to the right following direction of arrow), power is turned off to the entire Carrier, except for PM management power.

3.1.3.2 ATCA LEDs

The LEDs farthest from the handle are standard ATCA-controlled LEDs.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per AMC.0 and MicroTCA specifications. Note the PM is not removable.
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
Upgrade	Amber	ON while the PM operation is interrupted during a firmware upgrade.

Table 10: Typical PM LEDs

3.1.3.3 Command Line Interface

The integrated PM implements a Command Line Interface (CLI) to provide power and temperature status independently of the MCH. Access to this interface is provided by the serial RS232 port on the DA123. The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the carrier, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81).

The common CLI provided by VadaTech MicroTCA Power Modules is described in the VadaTech MicroTCA Power Module Command Line Interface Reference Manual. In addition to the common functions, this version of the CLI provides the status of the removable power supplies as shown below:

```
PEM 1:
  Present: Yes
  Temperature: OK.
  Fan: OK.
  AC Input: Present.
  DC Output: OK.

PEM 2:
  Present: Yes
  Temperature: Over Temp.
  Fan: Failed.
  AC Input: Present.
  DC Output: Bad.
```

Figure 13: Power Module Status Display

The following status is shown for each Power Entry Module (PEM):

- **Present**: **Yes** or **No**. If the PEM is not present, the remaining fields will not be displayed.
- **Temperature**: **OK** or **Over Temp**. This is the PEM's internal temperature status.
- **Fan**: **OK** or **Failed**. This is the status of the PEM's internal fans.
- **AC Input**: **Absent** or **Present**. This is the status of the external power connector on the PEM.
- **DC Output**: **OK** or **Bad**. This is the status of the power between the PEM and the carrier. This status can be **Bad** as a result of a temperature, fan or AC Input failure.

Any of the status fields may also be reported as "**Unknown**", which indicates a failure of the PM's Management Controller.

The PM will report changes in PEM status as they occur, regardless of which screen is displayed.

3.1.3.4 Sensors

This PM provides the following sensors:

Number	Type	Name	Description
0x10	0x01	PM tIN	Incoming Air Temperature
0x11	0x01	PM tOUT1	Outgoing Air Temperature
0x12	0x01	PM tOUT2	Outgoing Air Temperature
0x13	0x01	PM tOUT3	Outgoing Air Temperature
0x28	0x02	85X PM 12V	12V DC Power Output
0x90	0xF2	PM HOT SWAP	AMC Hot Swap Handle
0x91	0xF1	VT85X IPMB	ATCA IPMB-0 Status
0x94	0x08	PM STATUS	MicroTCA Power Module Status
0x95	0xF3	PM NOTIFICATION	MicroTCA Power Module Notification (Event-Only)
0x96	0x08	85X PM PWR IN	Input Power Redundancy (Based on PEM status)

Table 11: PM Sensors

3.1.4 JTAG Switch Module

The DA123 also contains a JTAG Switch Module (JSM) which provides JTAG support to all JTAG-capable Modules in the system, as shown by the red dashed box in **Figure 14**. The front connector is a standard 0.1 header which mates to most JTAG modules. The module provides transparent communication between the Master and a selected secondary port. All configuration modes use an IEEE1149.1 TAP controller. The JTAG can operate with a clock up to 50MhZ. There is also a JSM ACT LED that indicates activity in the chain.

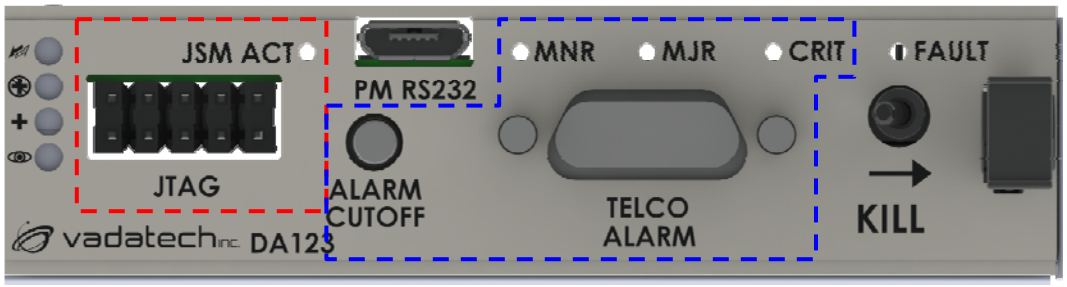

Figure 14: DA123 PM, JTAG, and Telco Interface

3.1.5 Telco Alarm Interface

The DA123 provides a Telco Alarm Interface, as shown by the blue dashed box in **Figure 14**.

3.1.5.1 Front Panel

The Telco Alarm Connector is used to relay alarm information to an external alarm device.

- The Critical (CRIT), Major (MJR), and Minor Alarm (MNR) LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be on.
- The ALARM CUTOFF button is used to engage the Telco Cutoff, turning off the external Telco alarms. The alarm LEDs will not change, but the external alarm device, if any, will be turned off. The Telco Cutoff can be disengaged using the Carrier Manager or Shelf CLI. When disengaged, the external Telco alarms will turn back on.

3.1.6 Backplane Topology

The VT850 and VT851 provide a dual-redundant IPMB-0 bus among the MCH, CU1, CU2, and PM modules. The IPMB-L bus is radial.

MCH Fabric A is connected to port 0 on all of the AMCs, and MCH Fabric B is connected to port 1 on all of the AMCs.

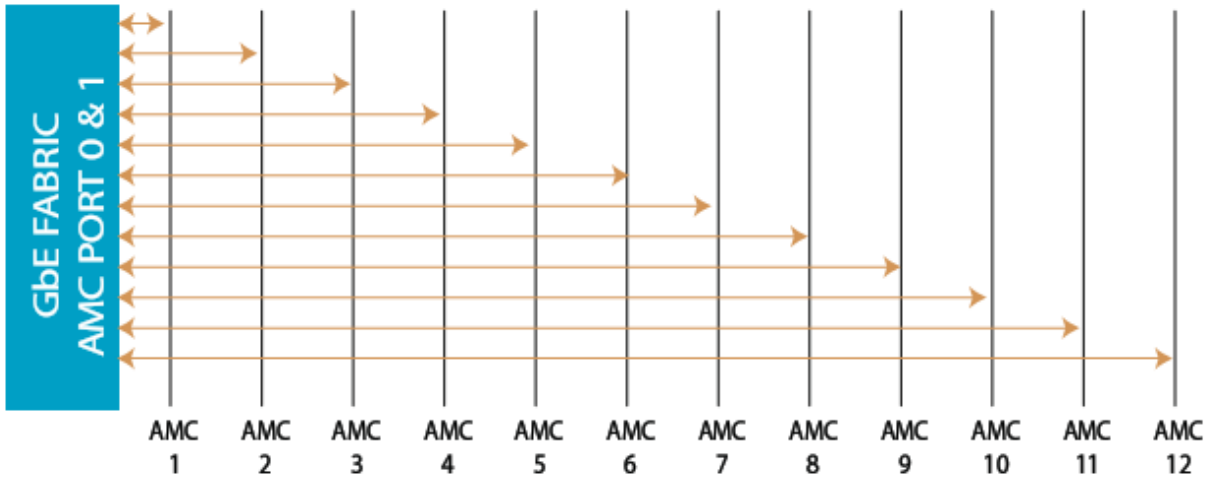

Figure 15: Fabric Topology for AMC Ports 0 and 1

AMC ports 2 and 3 (SAS / SATA) are routed directly between AMCs. AMC A1 port 2 is connected to AMC B1 port 2. AMC A1 port 3 is connected to AMC B2 port 2. In the same way, AMC A3 is connected to AMC B3 and AMC B4, and AMC A5 is connected to AMC B5 and AMC B6.

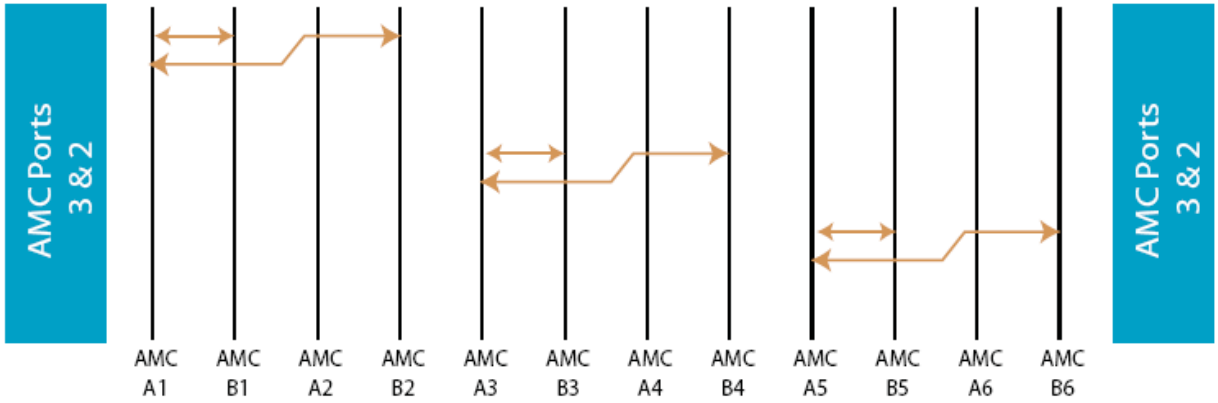

Figure 16: Fabric Topology for AMC Ports 2 and 3

In the fat pipes region, MCH fabrics D through G are connected to AMC ports 4 through 7.

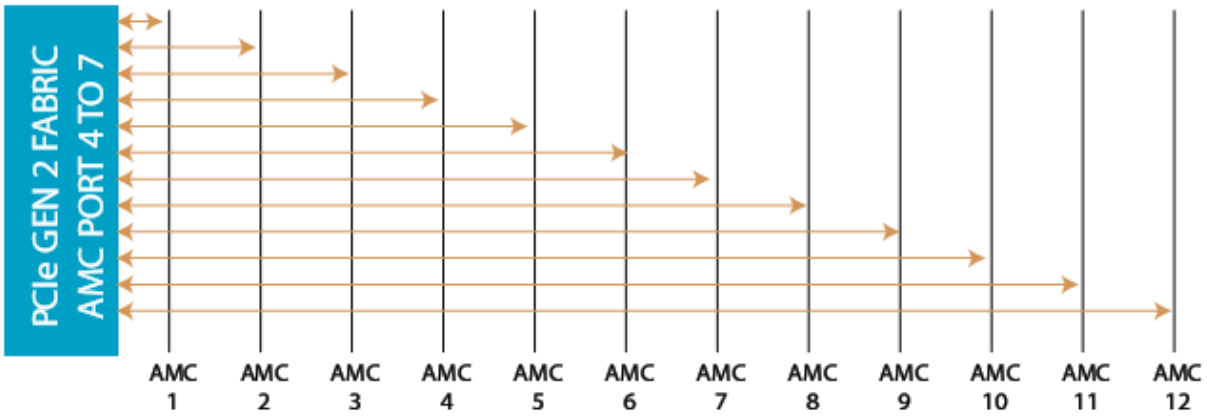

Figure 17: Fabric Topology for Fat Pipes Region

Depending on the clock options selected, some fabrics may not be routed. Refer to the data sheet for details.

3.2 VT852

3.2.1 Components

3.2.1.1 Slot Layout

The VT852 carrier includes a MicroTCA Carrier Hub (MCH), a MicroTCA Power Module (PM) and two MicroTCA Cooling Units (CUs). A front panel provides access to these components as well as Dual QSFP Ports connected to the switch fabric. The slot layout is shown in Figure 18.

Figure 18: VT852 Front Side AMC Slot Layout.

Figure 19: VT852 Back Side Layout.

Slot	IPMB-L Address	FRU
A1	0x72	5
B1	0x74	6
A2	0x76	7
B2	0x78	8
A3	0x7A	9
B3	0x7C	10

Table 12: AMC Slot Numbering

3.2.2 MicroTCA Carrier Hub

Access to this MCH is provided via the main front panel shown in **Figure 20**.

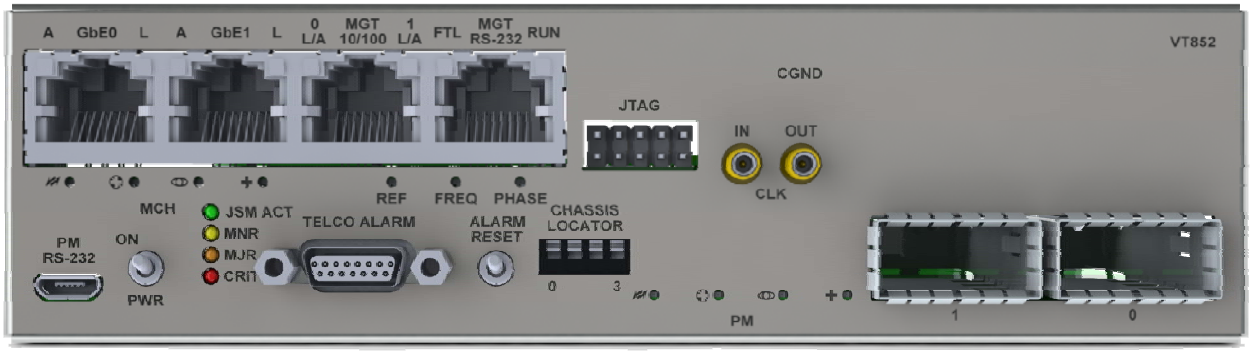

Figure 20: VT852's Main Front Panel.

3.2.2.1 ATCA LEDs

The four LEDs lined up horizontally on the right side of the panel are ATCA-controlled LEDs.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
General Purpose	Amber	Unused

Table 13: Typical MCH LEDs

3.2.2.2 Clock Interface

CLK IN / OUT are the clock signals. REF, FREQ, and PHASE indicate the clock state. Refer to VadaTech UTC001 and VT852 Telco - GPS Clock Configuration Guide for details.

3.2.2.3 Data Interfaces

The MGT RS-232 port provides console access to the MCH. The serial port is an RJ-45 connector. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81). The MGT10/100 provides Ethernet access to the MCH. This MCH supports SSH, RMCP, SNMP and HTTP connections. Refer to the VadaTech MicroTCA manuals listed in Section 1.1 for details. The GbE0 and GbE1 ports provide access to the Ethernet fabric switch, which is connected to the AMCs and the MCH.

3.2.2.4 Cooling Units

This carrier includes two integrated MicroTCA CUs. Each of these CUs provides the following sensors:

Number	Type	Name	Description
0x10	0x01	VT 853 CU T1	Temperature (LM75)
0x33	0x01	VT 853 CU T2	Temperature (ADT 7462 internal)
0x48	0x04	FAN1 RPM	RPM
0x49	0x04	FAN2 RPM	RPM
0x4A	0x04	FAN3 RPM	RPM
0x30	0x01	VT 853 CU T3	Temperature (ADT 7462 external)
0x31	0x01	VT 853 CU T4	Temperature (ADT 7462 external)
0x32	0x01	VT 853 CU T5	Temperature (ADT 7462 external)
0x90	0xF2	VT 853 CU HS	AMC Hot Swap Handle
0x91	0xF1	VT 853 CU IPMB	ATCA IPMB-0 Status

Table 14: Common Cooling Unit Sensors

CU1 provides the Telco function, and supports this additional sensor:

Number	Type	Name	Description
0x3F	0xF4	TELCO ALARM	Telco Alarm Status

Table 15: Cooling Unit 1 Sensors

3.2.2.5 Fan Trays

The VT852 carrier is designed for a Right-To-Left airflow and is equipped with removable Fan Trays on both intake and outtake sides of the chassis.

Each fan tray provides four LEDs and a hot swap button, as shown in Figure 21.

Figure 21: DA164 Front Panel

The Fan Tray LEDs indicate the state of the CU, as described in the following table.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per AMC.0 and MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. BLINKING indicates that one or more fans have stalled, or are still spinning up. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
Upgrade	Amber	ON while the CU operation is interrupted during a firmware upgrade.

Table 16: Typical Fan Tray LEDs

At power-on, the hot swap handle state is Closed. Pushing the Hot Swap button once toggles the handle state to Open. Pushing the Hot Swap button again toggles the handle state to Closed.

Removal of the Fan Tray is done via the captive screw.

3.2.2.6 Carrier Number Configuration

To set the Carrier number, set the Chassis Locator switch according to Table 4. The Chassis Locator switch is found on the Main Front Panel, as shown by the red shaded box in **Figure 22**.

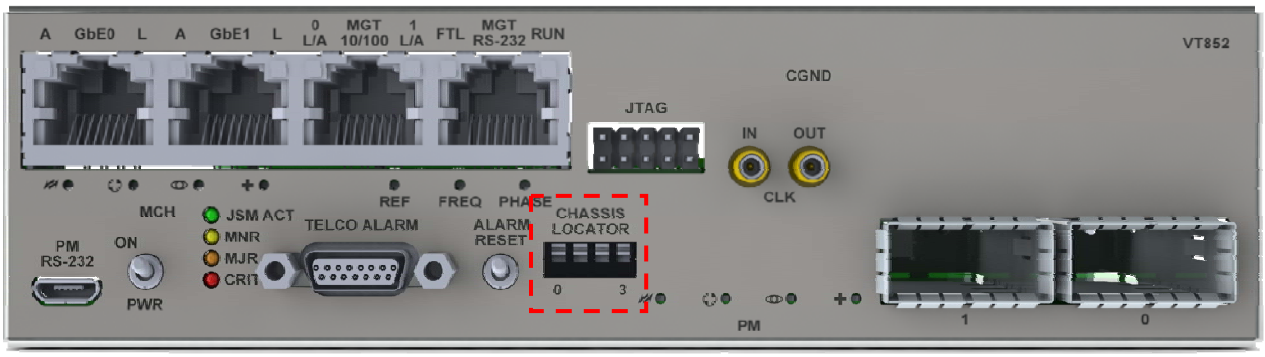

Figure 22: VT852 Chassis Locator Switch

3.2.3 Power Module

This Carrier includes an integrated MicroTCA PM. The PM gets its power from a single removable power supply, also called Power Entry Module or PEM. The PEM FRU Inventory is read when the power is first turned on to determine the PM power capability. Access to the PM is provided via the main front panel, as shown by the red shaded box in **Figure 23**.

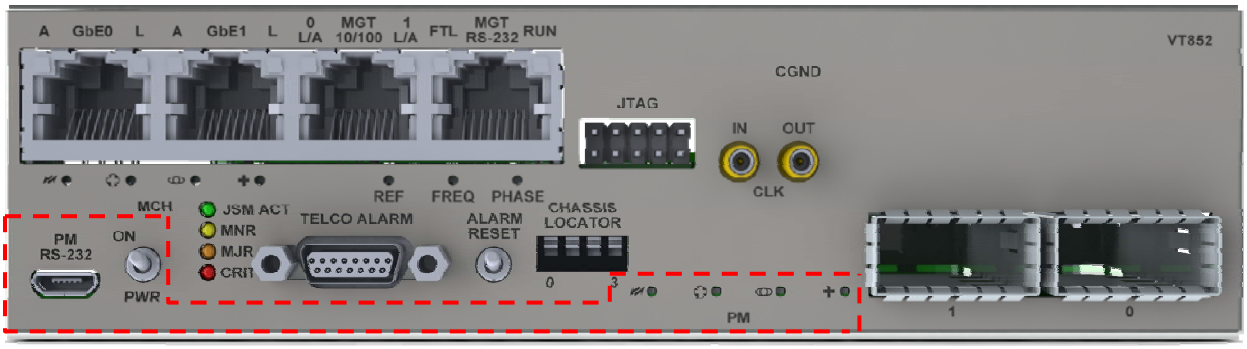

Figure 23: VT852 PM Interface

3.2.3.1 PWR Switch

In order for the system to run, the PWR switch must be in the "ON" position. The Power Switch directly controls the removable power supplies. When the switch is turned off, power is turned off to the entire Carrier, except for PM management power.

3.2.3.2 ATCA LEDs

The LEDs located on the bottom right side of the panel are standard ATCA-controlled LEDs.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per AMC.0 and MicroTCA specifications. Note the PM is not removable.
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
Upgrade	Amber	ON while the PM operation is interrupted during a firmware upgrade.

Table 17: Typical PM LEDs

3.2.3.3 Command Line Interface

The integrated PM implements a Command Line Interface (CLI) to provide power and temperature status independently of the MCH. Access to this interface is provided by the serial RS232 port on the main panel (PM RS-232). The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the carrier, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81).

The common CLI provided by VadaTech MicroTCA Power Modules is described in the VadaTech MicroTCA Power Module Command Line Interface Reference Manual. In addition to the common functions, this version of the CLI provides the status of the removable power supplies as shown below:

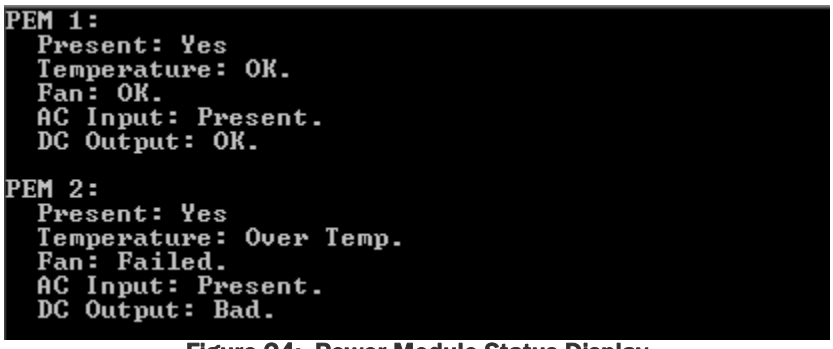

Figure 24: Power Module Status Display

The following status is shown for each Power Entry Module (PEM):

- **Present**: **Yes** or **No**. If the PEM is not present, the remaining fields will not be displayed.
- **Temperature**: **OK** or **Over Temp**. This is the PEM's internal temperature status.
- **Fan**: **OK** or **Failed**. This is the status of the PEM's internal fans.
- **AC Input**: **Absent** or **Present**. This is the status of the external power connector on the PEM.
- **DC Output**: **OK** or **Bad**. This is the status of the power between the PEM and the carrier. This status can be **Bad** as a result of a temperature, fan or AC Input failure.

Any of the status fields may also be reported as "**Unknown**", which indicates a failure of the PM's Management Controller.

The PM will report changes in PEM status as they occur, regardless of which screen is displayed.

3.2.3.4 Sensors

This PM provides the following sensors:

Number	Type	Name	Description
0x13	0x01	PM tIN	Incoming Air Temperature
0x12	0x01	PM tOUT1	Outgoing Air Temperature
0x14	0x01	PM tOUT2	Outgoing Air Temperature
0x28	0x02	852 PM 12V	12V DC Power Output
0x90	0xF2	PM HOT SWAP	AMC Hot Swap Handle
0x91	0xF1	VT852 IPMB	ATCA IPMB-0 Status
0x94	0x08	PM STATUS	MicroTCA Power Module Status
0x95	0xF3	PM NOTIFICATION	MicroTCA Power Module Notification (Event-Only)
0x96	0x08	852 PM PWR IN	Input Power Redundancy (Based on PEM status)

Table 18: PM Sensors

3.2.4 JTAG Switch Module

The VT852 contains a JTAG Switch Module (JSM) which provides JTAG support to all JTAG-capable Modules in the system. The front connector is a standard 0.1 header which mates to most JTAG modules. The module provides transparent communication between the Master and a selected secondary port. All configuration modes use an IEEE1149.1 TAP controller. The JTAG can operate with a clock up to 50MhZ.

The main front panel also offers a dedicated green LED (JSM ACT) to denote activity status on the JTAG interface. The mentioned connector and LED are highlighted below in **Figure 25**.

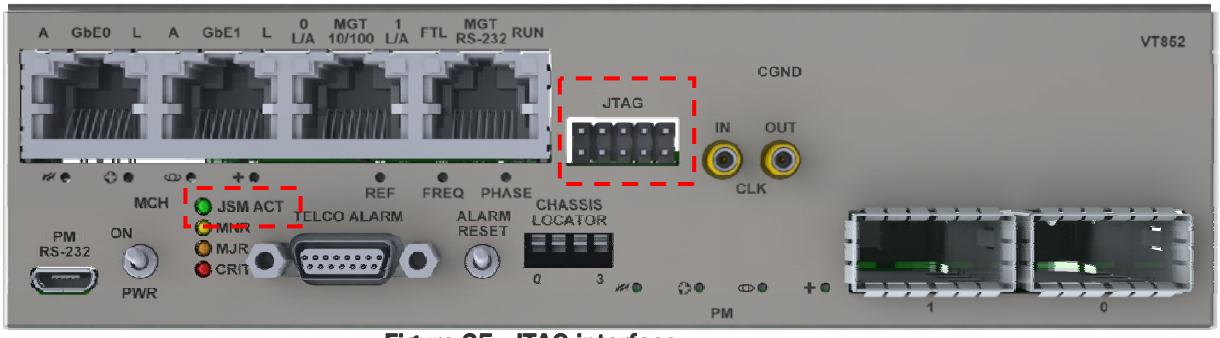

Figure 25: JTAG interface

3.2.5 Telco Alarm Interface

3.2.5.1 Front Panel

The Telco Alarm Connector is used to relay alarm information to an external alarm device.

- The Critical (CRIT), Major (MJR), and Minor Alarm (MNR) LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be on.
- The ALARM RESET temporary switch is used to engage the Telco Cutoff, turning off the external Telco alarms. The alarm LEDs will not change, but the external alarm device, if any, will be turned off. The Telco Cutoff can be disengaged using the Carrier Manager or Shelf CLI. When disengaged, the external Telco alarms will turn back on.

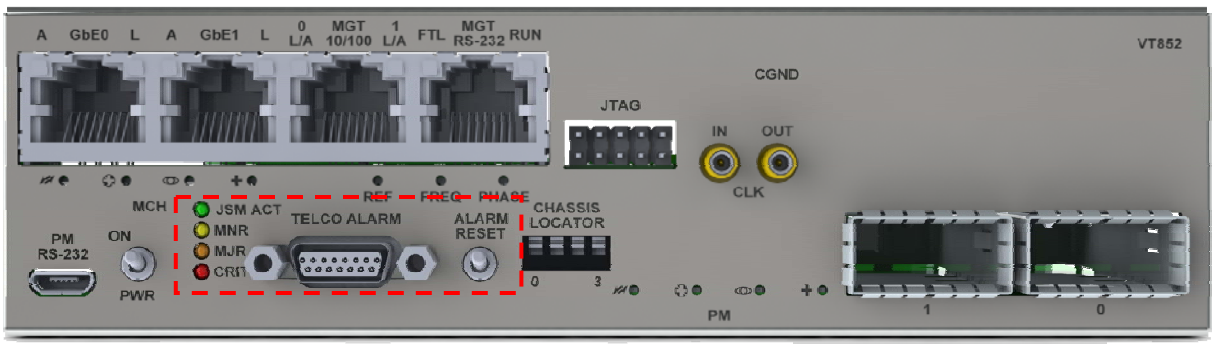

Figure 26: Telco Alarm interface

3.2.6 Backplane Topology

The VT852 provides a dual-redundant IPMB-0 bus among the MCH, CU1, CU2, and PM module. The IPMB-L bus is radial.

MCH Fabric A is connected to port 0 on all of the AMCs, and MCH Fabric B is connected to port 1 on all of the AMCs.

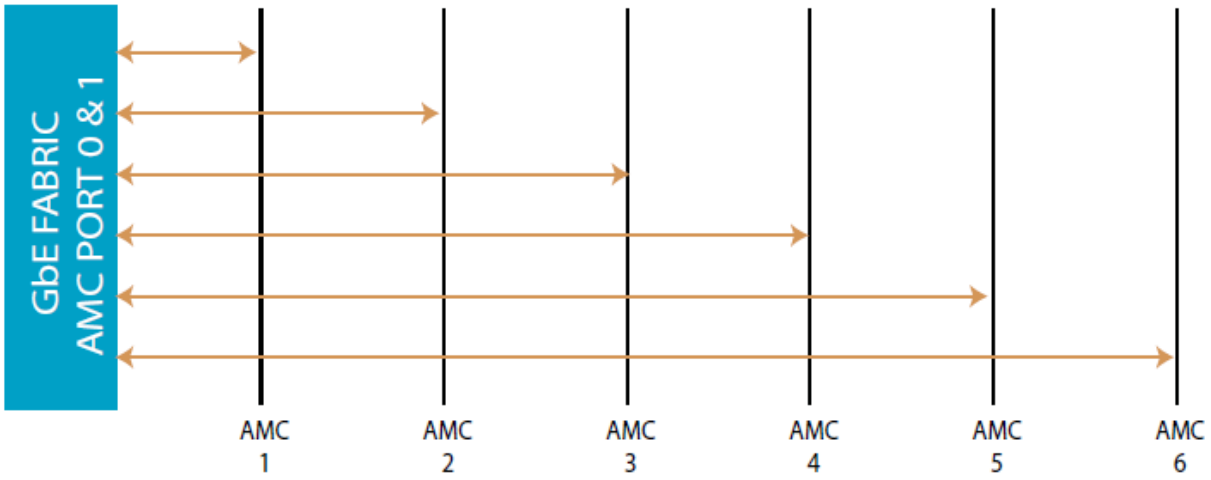

Figure 27: Fabric Topology for AMC Ports 0 and 1

AMC ports 2 and 3 (SAS / SATA) are routed directly between AMCs. AMC A1 port 2 is connected to AMC B1 port 2. AMC A1 port 3 is connected to AMC B2 port 2. In similar way, AMC A3 port 2 is connected to AMC B3 port 2. AMC A3 port 3 is connected to AMC A2 port 2.

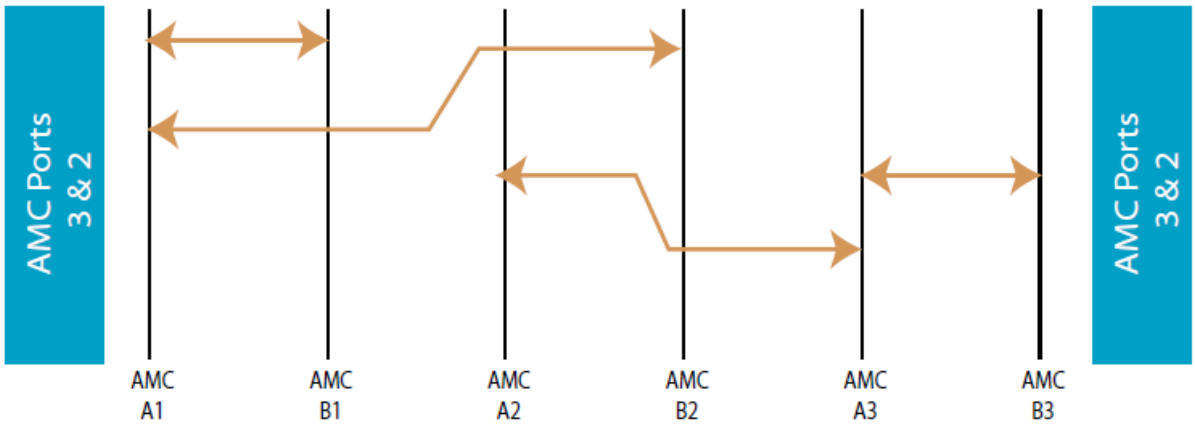

Figure 28: Fabric Topology for AMC Ports 2 and 3

In the fat pipes region, MCH fabrics on ports 4-7 are connected to AMC ports 4 through 7. With option to route PCIe Gen2, SRIO or 10GbE switch fabric.

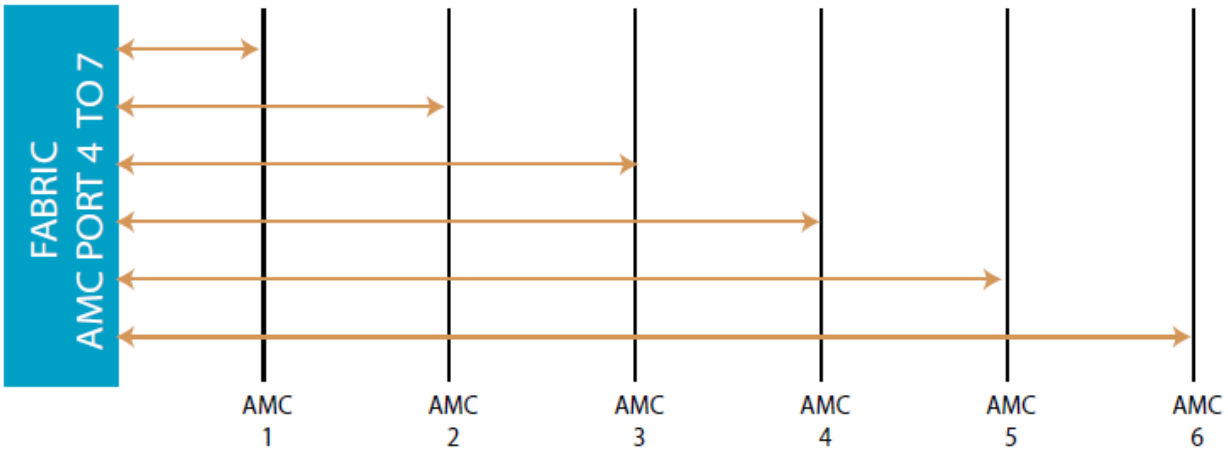

Figure 29: Fabric Topology for Ports 4-7

In the same way, MCH fabrics on ports 8-11 are connected to AMC ports 8 through 11. With option to route PCIe Gen2, SRIO or 10GbE switch fabric.

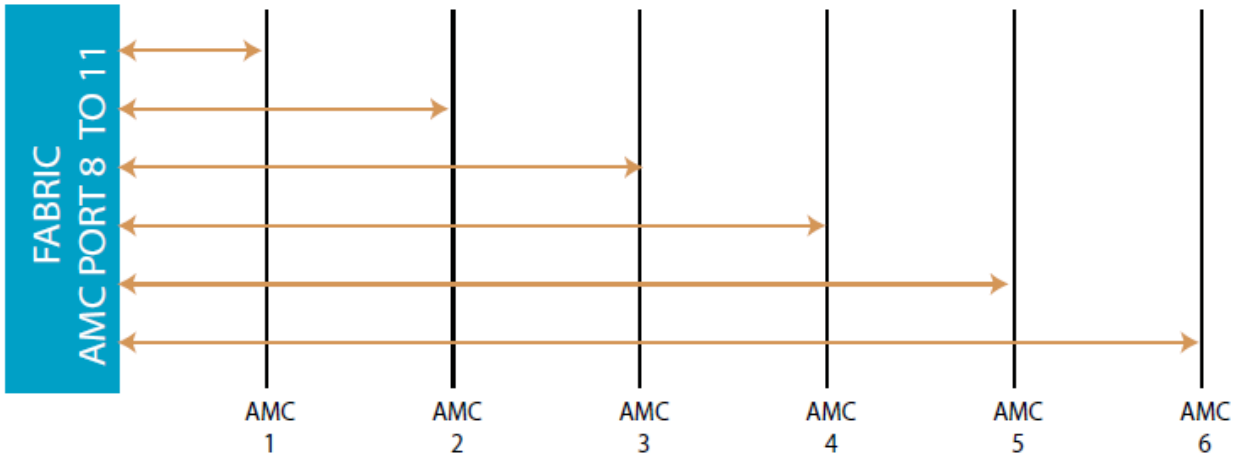

Figure 30: Fabric Topology for Ports 8-11

With the SRIO there are two options, SRIO x4 on all the ports 8-11 or on slots B2 and B3 only. Each configuration is an ordering option.

3.3 VT853

3.3.1 Components

3.3.1.1 Slot Layout

The VT853 carrier includes a MicroTCA Carrier Hub (MCH), a MicroTCA Power Module (PM) and two MircoTCA Cooling Units (CUs). A front panel provides access to these components as well as Dual QSFP Ports connected to the switch fabric. The slot layout is shown in **Figure 31 and Figure 32**.

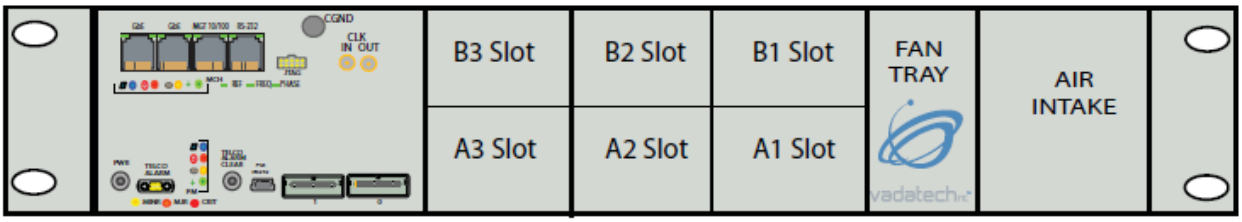

Figure 31: VT853 Front Side AMC Slot Layout.

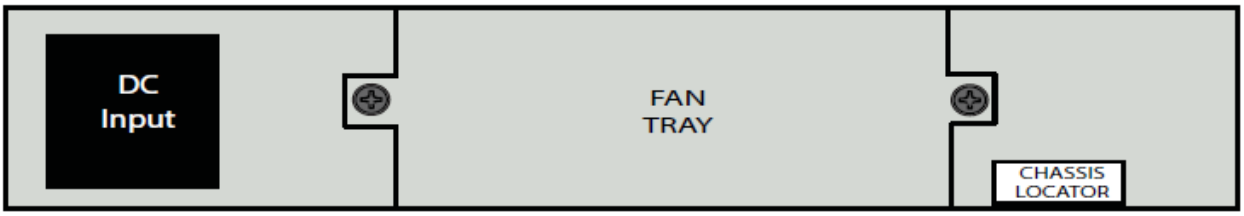

Figure 32: VT853 Back Side Layout.

Slot	IPMB-L Address	FRU
A1	0x72	5
B1	0x74	6
A2	0x76	7
B2	0x78	8
A3	0x7A	9
B3	0x7C	10

Table 19: AMC Slot Numbering

3.3.2 MicroTCA Carrier Hub

Access to this MCH is provided via the main front panel shown on **Figure 33**.

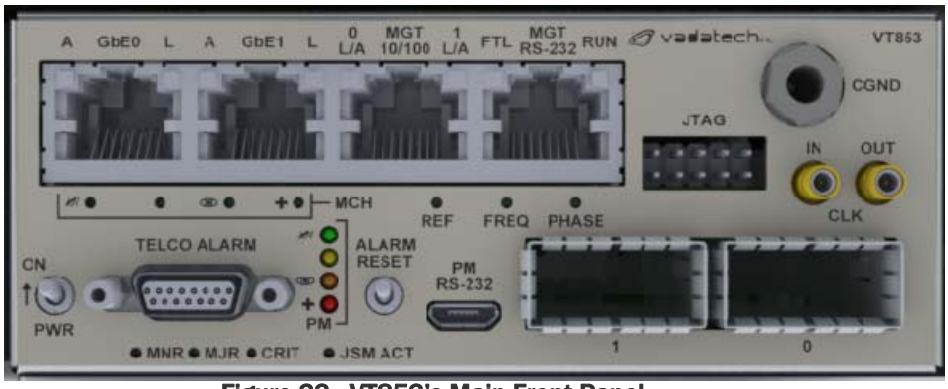

Figure 33: VT853's Main Front Panel.

3.3.2.1 ATCA LEDs

The four LEDs lined up horizontally on the right side of the panel are ATCA-controlled LEDs.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
General Purpose	Amber	Unused

Table 20: Typical MCH LEDs

3.3.2.2 Clock Interface

CLK IN / OUT are the clock signals. REF, FREQ, and PHASE indicate the clock state. Refer to VadaTech UTC001 and VT853 Telco - GPS Clock Configuration Guide for details.

3.3.2.3 Data Interfaces

The MGT RS-232 port provides console access to the MCH. The serial port is a RJ-45 connector. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81). The MGT10/100 provides Ethernet access to the MCH. This MCH supports SSH, RMCP, SNMP and HTTP connections. Refer to the VadaTech MicroTCA manuals listed in Section 1.1 for details. The GbE0 and GbE1 ports provide access to the Ethernet fabric switch, which is connected to the AMCs and the MCH.

3.3.2.4 Cooling Units

This carrier includes two integrated MicroTCA CUs. Each of these CUs provides the following sensors:

Number	Type	Name	Description
0x10	0x01	VT 853 CU T1	Temperature (LM75)
0x33	0x01	VT 853 CU T2	Temperature (ADT 7462 internal)
0x48	0x04	FAN1 RPM	RPM
0x49	0x04	FAN2 RPM	RPM
0x4A	0x04	FAN3 RPM	RPM
0x30	0x01	VT 853 CU T3	Temperature (ADT 7462 external)
0x31	0x01	VT 853 CU T4	Temperature (ADT 7462 external)
0x32	0x01	VT 853 CU T5	Temperature (ADT 7462 external)
0x90	0xF2	VT 853 CU HS	AMC Hot Swap Handle
0x91	0xF1	VT 853 CU IPMB	ATCA IPMB-0 Status

Table 21: Common Cooling Unit Sensors

CU1 provides the Telco function, and supports this additional sensor:

Number	Type	Name	Description
0x3F	0xF4	TELCO ALARM	Telco Alarm Status

Table 22: Cooling Unit 1 Sensors

3.3.2.5 Fan Trays

The VT853 carrier is designed for a Front-To-Back airflow and is equipped with removable Fan Trays on both, intake and outtake sides of the chassis.

Each fan tray provides four LEDs and a hot swap button, as shown in **Figure 34** (**VT853's Rear Fan Tray**).

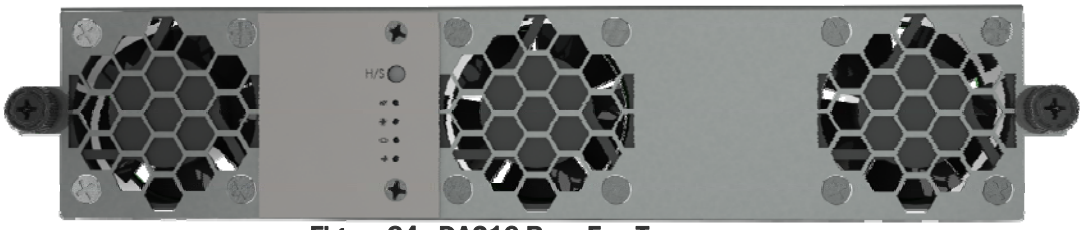

Figure 34: DA216 Rear Fan Tray

The Fan Tray LEDs indicate the state of the CU, as described in the following table.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per AMC.0 and MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. BLINKING indicates that one or more fans have stalled, or are still spinning up. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
Upgrade	Amber	ON while the CU operation is interrupted during a firmware upgrade.

Table 23: Typical Fan Tray LEDs

At power-on, the hot swap handle state is Closed. Pushing the Hot Swap button once toggles the handle state to Open. Pushing the Hot Swap button again toggles the handle state to Closed.
Removal of the Fan Tray is done via the captive screws.

3.3.2.6 Carrier Number Configuration

To set the Carrier number, set the Chassis Locator switch according to Table 4. The Chassis Locator switch is found on the back side of the VT853, as shown in **Figure 32**.

3.3.3 Power Module

This carrier includes an integrated MicroTCA PM. The PM gets its power from a single removable power supply, also called Power Entry Module or PEM. The PEM FRU Inventory is read when the power is first turned on to determine the PM power capability. Access to the PM is provided via the main front panel, as highlighted in **Figure 35**.

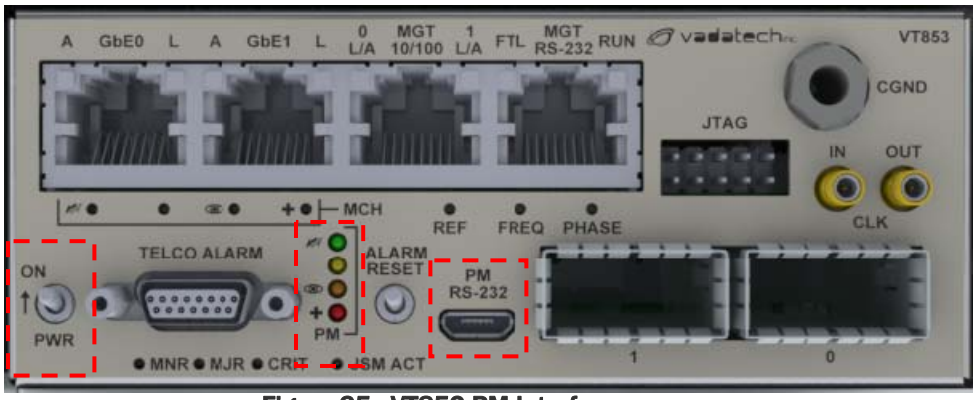

Figure 35: VT852 PM Interface

3.3.3.1 PWR Switch

In order for the system to run, the PWR switch must be in the "ON" position. The Power Switch directly controls the removable power supplies. When the switch is turned off, power is turned off to the entire Carrier, except for PM management power.

3.3.3.2 ATCA LEDs

The LEDs located on the main front panel to the right of the TELCO ALARM connector are standard ATCA-controlled LEDs.

- Blue: Hot-Swap, per MicroTCA. Note that the PM is not removable.
- Red: Fault. The PM cannot provide power to modules, per MicroTCA
- Green: Healthy. The PM can provide power.
- Amber: Upgrade. This LED goes on when the PM is out-of-service during a firmware upgrade.

3.3.3.3 Command Line Interface

The integrated PM implements a Command Line Interface (CLI) to provide power and temperature status independently of the MCH. Access to this interface is provided by the serial RS232 port on the main panel (PM RS-232). The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the carrier, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81).

The common CLI provided by VadaTech MicroTCA Power Modules is described in the VadaTech MicroTCA Power Module Command Line Interface Reference Manual

3.3.3.4 Sensors

This PM provides the following sensors:

Number	Type	Name	Description
0x10	0x01	FET TEMP	Temperature around Input Choke
0x11	0x01	BRICK 1 TEMP	Temperature around Brick Output
0x12	0x01	BRICK 2 TEMP	Outgoing Air Temperature
0x13	0x01	853 PM tIN	Incoming Air Temperature
0x14	0x01	853 PM tOUT	Outgoing Air Temperature
0x20	0x01	853 PM Brick T1	Internal Brick Temperature (smart brick only)
0x21	0x01	853 PM Brick T2	Internal Brick Temperature (smart brick only)
0x24	0x02	853 PM vOut1	Brick Output Voltage (smart brick only)
0x26	0x03	853 PM iOut1	Brick Output Current (smart brick only)
0x28	0x02	853 PM 12V	12V DC Power Output
0x90	0xF2	PM HOT SWAP	AMC Hot Swap Handle
0x91	0xF1	IPMB LINK	ATCA IPMB-0 Status
0x94	0x08	PM STATUS	MicroTCA Power Module Status
0x95	0xF3	PM NOTIFICATION	MicroTCA Power Module Notification (Event-Only)
0x96	0x08	853 PM PWR IN	Input Power Redundancy

Table 24: PM Sensors

3.3.4 JTAG Switch Module

The VT852 contains a JTAG Switch Module (JSM) which provides JTAG support to all JTAG-capable Modules in the system. The front connector is a standard 0.1 header which mates to most JTAG modules. The module provides transparent communication between the Master and a selected secondary port. All configuration modes use an IEEE1149.1 TAP controller. The JTAG can operate with a clock up to 50MhZ.

The main front panel also offers a dedicated green LED (JSM ACT) to denote activity status on the JTAG interface.

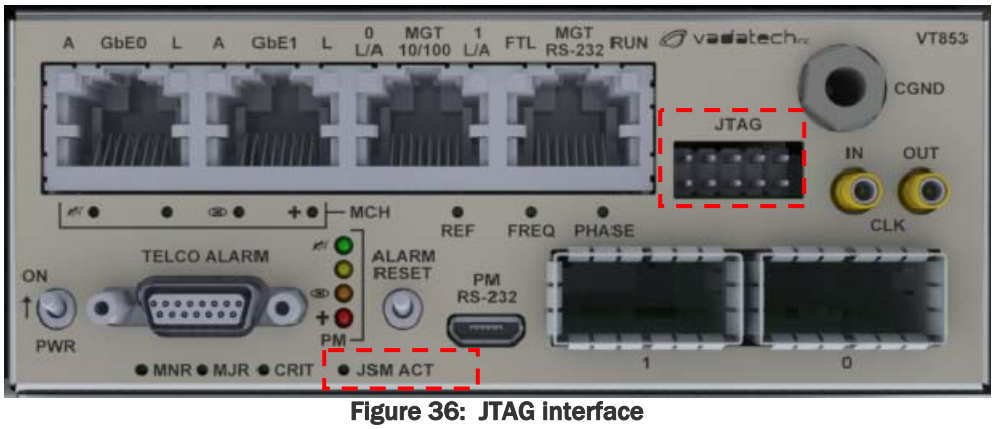

Figure 36: JTAG interface

3.3.5 Telco Alarm Interface

3.3.5.1 Front Panel

The Telco Alarm Connector is used to relay alarm information to an external alarm device.

- The Critical (CRIT), Major (MJR), and Minor Alarm (MNR) LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be on.
- The ALARM RESET temporary switch is used to engage the Telco Cutoff, turning off the external Telco alarms. The alarm LEDs will not change, but the external alarm device, if any, will be turned off. The Telco Cutoff can be disengaged using the Carrier Manager or Shelf CLI. When disengaged, the external Telco alarms will turn back on.

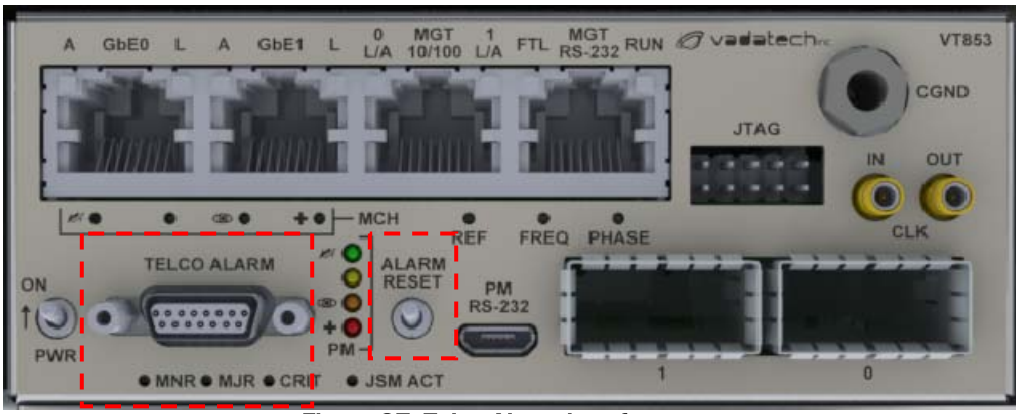

Figure 37: Telco Alarm interface

3.3.6 Backplane Topology

The VT853 provides a dual-redundant IPMB-0 bus among the MCH, CU1, CU2, and PM module. The IPMB-L bus is radial.

MCH Fabric A is connected to port 0 on all of the AMCs, and MCH Fabric B is connected to port 1 on all of the AMCs.

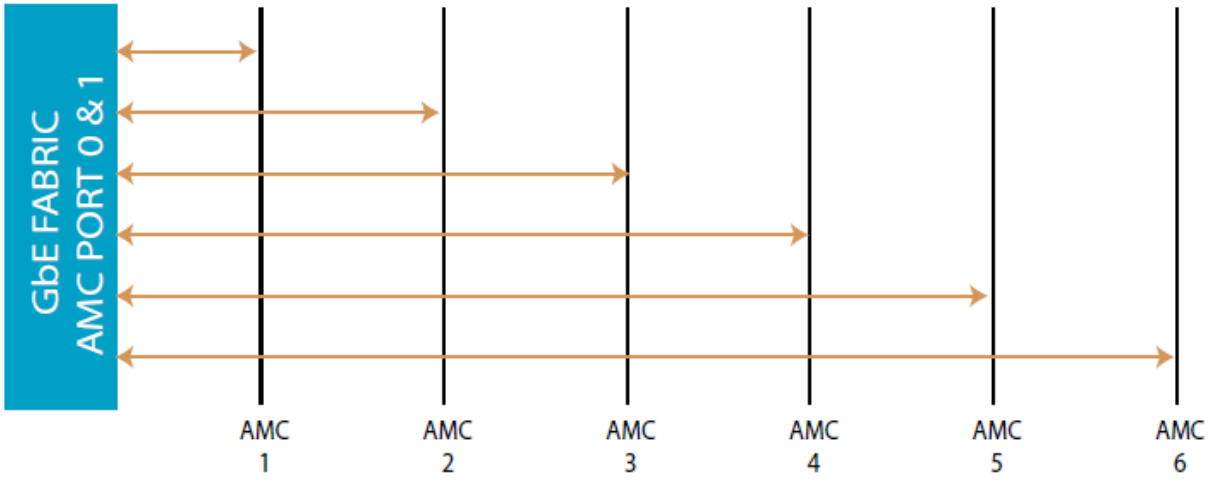

Figure 38: Fabric Topology for AMC Ports 0 and 1

AMC ports 2 and 3 (SAS / SATA) are routed directly between AMCs. AMC A1 port 2 is connected to AMC B1 port 2. AMC A1 port 3 is connected to AMC B2 port 2. In similar way, AMC A3 port 2 is connected to AMC B3 port 2. AMC A3 port 3 is connected to AMC A2 port 2.

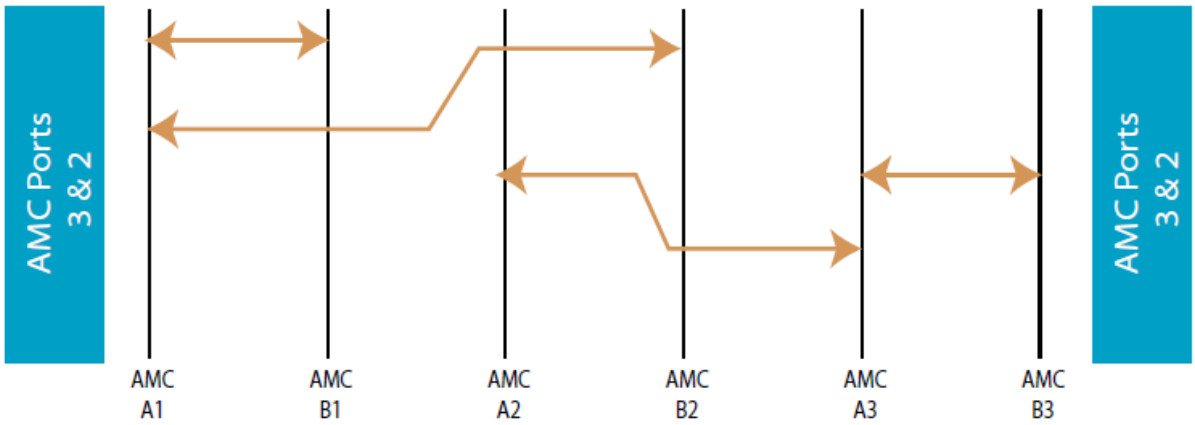

Figure 39: Fabric Topology for AMC Ports 2 and 3

In the fat pipes region, MCH fabrics on ports 4-7 are connected to AMC ports 4 through 7. With option to route PCIe Gen2, SRIO or 10GbE switch fabric or point to point.

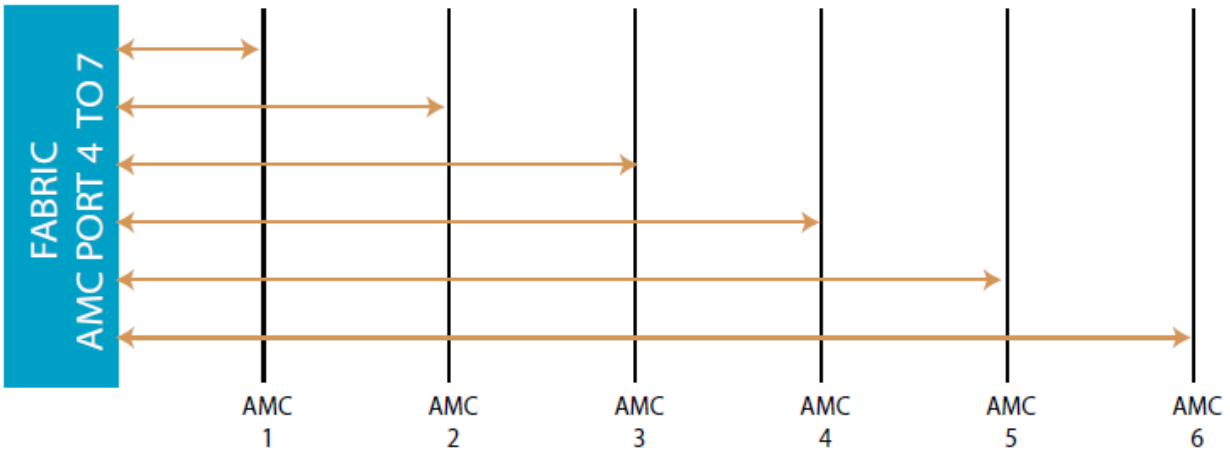

Figure 40: Fabric Topology for Ports 4-7

In the same way, MCH fabrics on ports 8-11 are connected to AMC ports 8 through 11. With option to route PCIe Gen2, SRIO or 10GbE switch fabric.

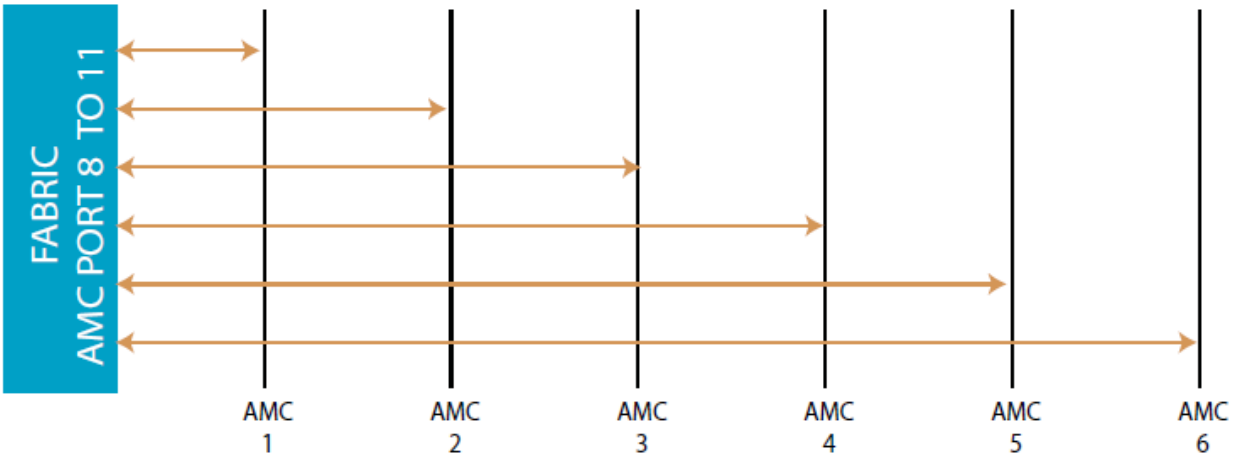

Figure 41: Fabric Topology for Ports 8-11

With the SRIO there are two options, SRIO x4 on all the ports 8-11 or on slots B2 and B3 only. Each configuration is an ordering option.

3.4 VT855

3.4.1 Components

3.4.1.1 Slot Layout

The VT855 carrier includes a MicroTCA Carrier Hub (MCH), a MicroTCA Power Module (PM) and a MircoTCA Cooling Unit (CU). A front panel provides access to these components. The slot layout is shown in Figure 42 and Figure 43.

Figure 42: VT855 Front Side AMC Slot Layout

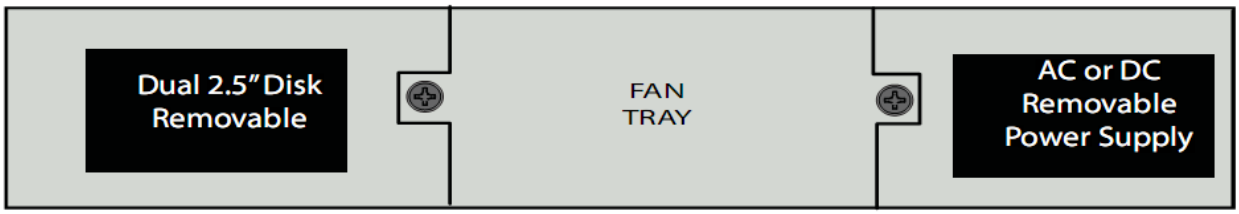

Figure 43: VT855 Back Side Layout

Slot	IPMB-L Address	FRU
A1	0x72	5
B1	0x74	6

Table 25: AMC Slot Numbering

3.4.2 MicroTCA Carrier Hub

Access to this MCH is provided via the main front panel shown on Figure 44.

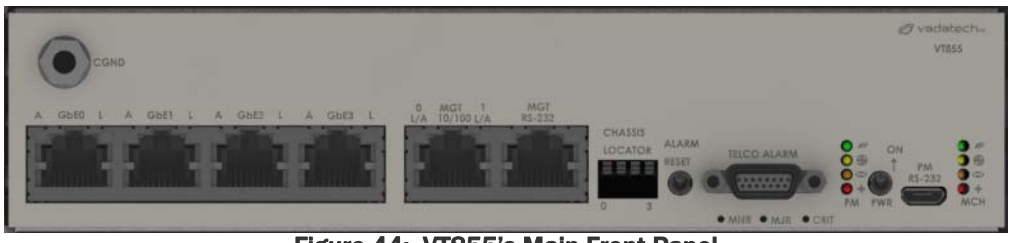

Figure 44: VT855's Main Front Panel

3.4.2.1 ATCA LEDs

The four LEDs lined up horizontally on the right side of the panel are ATCA-controlled LEDs.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
General Purpose	Amber	Unused

Table 26: Typical MCH LEDs

3.4.2.2 Data Interfaces

The MGT RS-232 port provides console access to the MCH. The serial port is a RJ-45 connector. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81). The MGT10/100 provides Ethernet access to the MCH. This MCH supports SSH, RMCP, SNMP and HTTP connections. Refer to the VadaTech MicroTCA manuals listed in Section 1.1 for details. The GbE0, GbE1, GbE2 and GbE3 ports provide access to the Ethernet fabric switch, which is connected to the AMCs and the MCH.

3.4.2.3 Cooling Units

This carrier includes an integrated MicroTCA CU. The CU provides the following sensors:

Number	Type	Name	Description
0x10	0x01	VT 855 CU T1	Temperature (LM75)
0x33	0x01	VT 855 CU T2	Temperature (ADT 7462 internal)
0x48	0x04	FAN1 RPM	RPM
0x49	0x04	FAN2 RPM	RPM
0x4A	0x04	FAN3 RPM	RPM
0x30	0x01	VT 855 CU T3	Temperature (ADT 7462 external)
0x31	0x01	VT 855 CU T4	Temperature (ADT 7462 external)
0x32	0x01	VT 855 CU T5	Temperature (ADT 7462 external)
0x90	0xF2	VT 855 CU HS	AMC Hot Swap Handle
0x91	0xF1	VT 855 CU IPMB	ATCA IPMB-0 Status
0x3F	0xF4	TELCO ALARM	Telco Alarm Status

Table 27: Common Cooling Unit Sensors

3.4.2.4 Fan Trays

The VT855 carrier is designed for a Front-To-Back airflow and is equipped with removable Fan Trays on both, intake and outtake sides of the chassis.

Each fan tray provides four LEDs and a hot swap button, as shown in Figure 45.

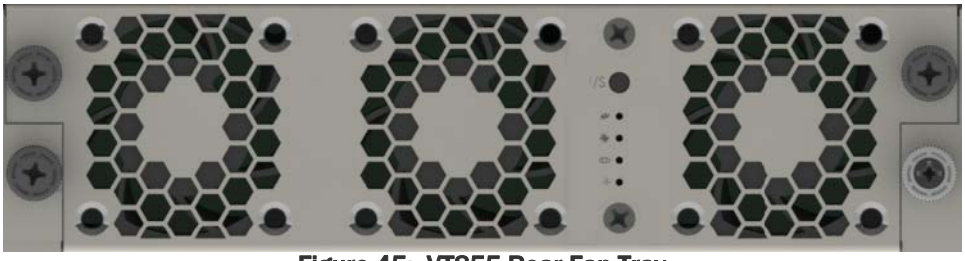

Figure 45: VT855 Rear Fan Tray

The Fan Tray LEDs indicate the state of the CU, as described in the following table.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per AMC.0 and MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. BLINKING indicates that one or more fans have stalled, or are still spinning up. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
Upgrade	Amber	ON while the CU operation is interrupted during a firmware upgrade.

Table 28: Typical Fan Tray LEDs

At power-on, the hot swap handle state is Closed. Pushing the Hot Swap button once toggles the handle state to Open. Pushing the Hot Swap button again toggles the handle state to Closed.
Removal of the Fan Tray is done via the captive screws.

3.4.2.5 Carrier Number Configuration

To set the Carrier number, set the Chassis Locator switch according to Table 4. The Chassis Locator switch is found on the front side of the VT855, as shown in Figure 46.

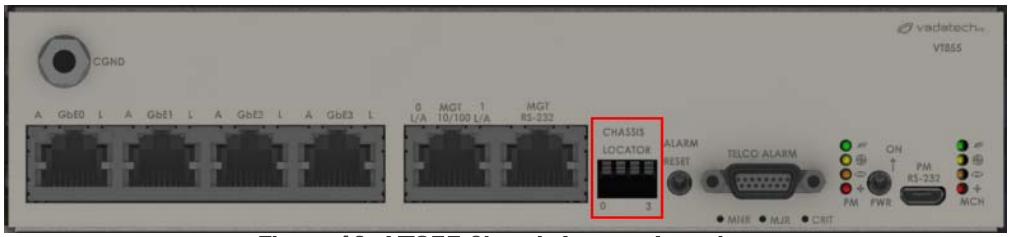

Figure 46: VT855 Chassis Locator Location

3.4.3 Power Module

This carrier includes an integrated MicroTCA PM. The PM gets its power from a single removable power supply, also called Power Entry Module or PEM. The PEM FRU Inventory is read when the power is first turned on to determine the PM power capability. Access to the PM is provided via the main front panel, as highlighted in Figure 47.

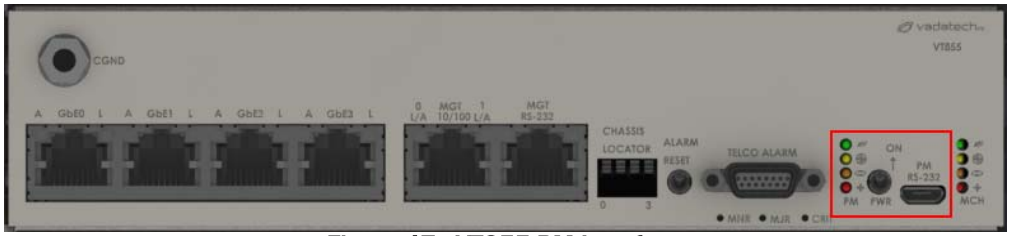

Figure 47: VT855 PM Interface

3.4.3.1 PWR Switch

In order for the system to run, the PWR switch must be in the "ON" position. The Power Switch directly controls the removable power supplies. When the switch is turned off, power is turned off to the entire Carrier, except for PM management power.

3.4.3.2 ATCA LEDs

The LEDs located on the main front panel to the right of the TELCO ALARM connector are standard ATCA-controlled LEDs.

- Blue: Hot-Swap, per MicroTCA. Note that the PM is not removable.
- Red: Fault. The PM cannot provide power to modules, per MicroTCA
- Green: Healthy. The PM can provide power.
- Amber: Upgrade. This LED goes on when the PM is out-of-service during a firmware upgrade.

3.4.3.3 Command Line Interface

The integrated PM implements a Command Line Interface (CLI) to provide power and temperature status independently of the MCH. Access to this interface is provided by the serial RS232 port on the main panel (PM RS-232). The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the carrier, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81).

The common CLI provided by VadaTech MicroTCA Power Modules is described in the VadaTech MicroTCA Power Module Command Line Interface Reference Manual

3.4.3.4 Sensors

This PM provides the following sensors:

Number	Type	Name	Description
0x10	0x01	FET TEMP	Temperature around Input Choke
0x11	0x01	BRICK 1 TEMP	Temperature around Brick Output
0x12	0x01	BRICK 2 TEMP	Outgoing Air Temperature
0x13	0x01	855 PM tIN	Incoming Air Temperature
0x14	0x01	855 PM tOUT	Outgoing Air Temperature
0x28	0x02	855 PM 12V	12V DC Power Output
0x90	0xF2	PM HOT SWAP	AMC Hot Swap Handle
0x91	0xF1	IPMB LINK	ATCA IPMB-0 Status
0x94	0x08	PM STATUS	MicroTCA Power Module Status
0x95	0xF3	PM NOTIFICATION	MicroTCA Power Module Notification (Event-Only)
0x96	0x08	855 PM PWR IN	Input Power Redundancy

Table 29: PM Sensors

3.4.4 Telco Alarm Interface

3.4.4.1 Front Panel

The Telco Alarm Connector is used to relay alarm information to an external alarm device.

- The Critical (CRIT), Major (MJR), and Minor Alarm (MNR) LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be on.
- The ALARM RESET temporary switch is used to engage the Telco Cutoff, turning off the external Telco alarms. The alarm LEDs will not change, but the external alarm device, if any, will be turned off. The Telco Cutoff can be disengaged using the Carrier Manager or Shelf CLI. When disengaged, the external Telco alarms will turn back on.

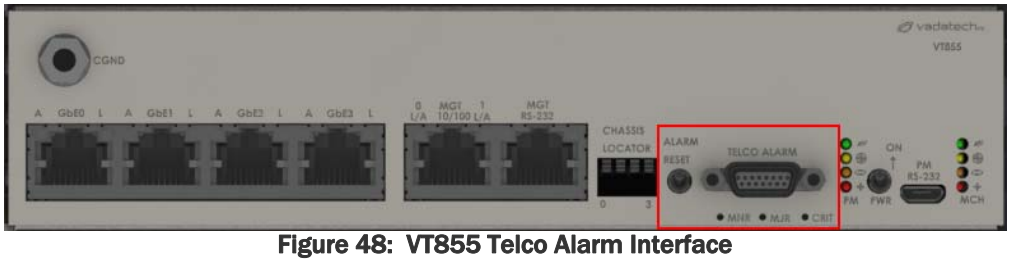

Figure 48: VT855 Telco Alarm Interface

3.4.5 Backplane Topology

The VT855 provides a dual-redundant IPMB-0 bus among the MCH, CU, and PM module. The IPMB-L bus is radial.

Port 0 and 1 of each AMC is routed to the on board GbE Fabric. In addition the un-managed GbE has four ports routed to the front and one port routed to the Management processor.

Figure 49: VT855 Fabric Topology for AMC Ports 0 and 1

Fabric clock (FCLK, 100Mhz HCSL) is routed directly from the clock generator to each AMC. The TCLKA and TCLKB are crossed and TCLKC and TCLKD are crossed.

Ports 2 and 3 are routed with the options in Table 30.

Ordering option (option C)	A1 slot Ports 2 and 3	B1 slot Ports 2 and 3
0	Direct connect to B1 slot (ports 2-3)	Direct connect to A1 slot (ports 2-3)
1	Port 2 to the second 2.5” disk (port 3 to B1)	Port 2 to the first 2.5” disk (port 3 to A1)
2	No connect on ports 2 and 3	Port 2 and 3 to the Dual 2.5” Disk

Table 30: VT855 Fabric Topology for AMC Ports 2 and 3

Ports 4 to 7 are routed with the options in the Table 31.

Ordering option (option D)	A1 slot Ports 4-7	B1 slot Ports 4-7
0	Direct connect to B1 slot (ports 4-7)	Direct connect to A1 slot (ports 4-7)
1	No connect on ports 4-7	Port 4 to the 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7)
2	No connect on ports 4-7	Port 4 to 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7). Dual independent disk
3	No connect on ports 4-7	Port 4 to 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7) Raid 0
4	No connect on ports 4-7	Port 4 to 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7). Raid 1
5	Port 4 to the second 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7)	Port 4 to the first 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7)

Table 31: VT855 Fabric Topology for AMC Ports 4 to 7

Ports 8 to 11 and 17 to 20 are routed point to point between the two AMC slots.

3.5 VT856

3.5.1 Components

3.5.1.1 Slot Layout

The VT856 carrier includes a MicroTCA Carrier Hub (MCH), a MicroTCA Power Module (PM) and a MircoTCA Cooling Unit (CU). A front panel provides access to these components. The slot layout is shown in Figure 50 and Figure 51.

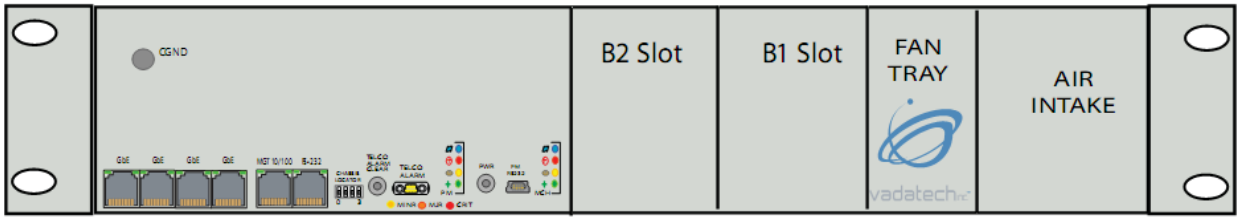

Figure 50: VT856 Front Side AMC Slot Layout

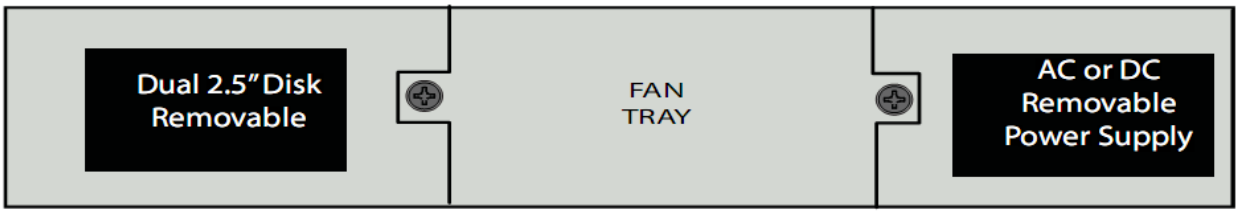

Figure 51: VT856 Back Side Layout

Slot	IPMB-L Address	FRU
A1	0x72	5
B1	0x74	6

Table 32: AMC Slot Numbering

3.5.2 MicroTCA Carrier Hub

Access to this MCH is provided via the main front panel shown on Figure 52.

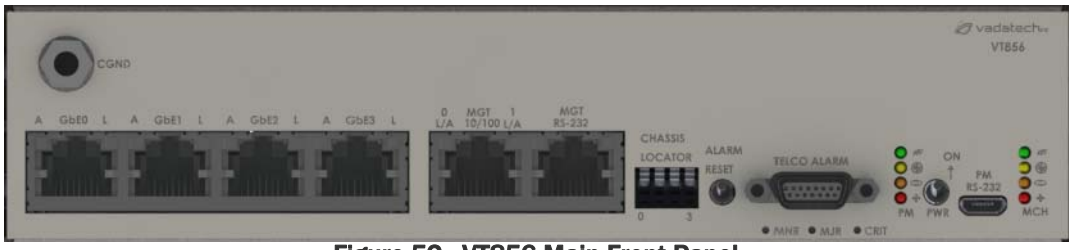

Figure 52: VT856 Main Front Panel

3.5.2.1 ATCA LEDs

The four LEDs lined up horizontally on the right side of the panel are ATCA-controlled LEDs.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. OFF indicates normal operation.
OK	Green	ON indicates normal operation.
General Purpose	Amber	Unused

Table 33: Typical MCH LEDs

3.5.2.2 Data Interfaces

The MGT RS-232 port provides console access to the MCH. The serial port is a RJ-45 connector. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81). The MGT10/100 provides Ethernet access to the MCH. This MCH supports SSH, RMCP, SNMP and HTTP connections. Refer to the VadaTech MicroTCA

manuals listed in Section 1.1 for details. The GbE0, GbE1, GbE2 and GbE3 ports provide access to the Ethernet fabric switch, which is connected to the AMCs and the MCH.

3.5.2.3 Cooling Units

This carrier includes an integrated MicroTCA CU. The CU provides the following sensors:

Number	Type	Name	Description
0x10	0x01	VT 855 CU T1	Temperature (LM75)
0x33	0x01	VT 855 CU T2	Temperature (ADT 7462 internal)
0x48	0x04	FAN1 RPM	RPM
0x49	0x04	FAN2 RPM	RPM
0x4A	0x04	FAN3 RPM	RPM
0x30	0x01	VT 856 CU T3	Temperature (ADT 7462 external)
0x31	0x01	VT 856 CU T4	Temperature (ADT 7462 external)
0x32	0x01	VT 856 CU T5	Temperature (ADT 7462 external)
0x90	0xF2	VT 856 CU HS	AMC Hot Swap Handle
0x91	0xF1	VT 856 CU IPMB	ATCA IPMB-0 Status
0x3F	0xF4	TELCO ALARM	Telco Alarm Status

Table 34: Common Cooling Unit Sensors

3.5.2.4 Fan Trays

The VT856 carrier is designed for a Front-To-Back airflow and is equipped with removable Fan Trays on both, intake and outtake sides of the chassis.

Each fan tray provides four LEDs and a hot swap button, as shown in Figure 53.

Figure 53: VT856 Rear Fan Tray

The Fan Tray LEDs indicate the state of the CU, as described in the following table.

Name	Color	Description
Hot Swap	Blue	indicates hot-swap state, per AMC.0 and MicroTCA specifications
Fail	Red	ON indicates failure. For example, the geographic address pins are invalid, or payload power has failed. BLINKING indicates that one or more fans have stalled, or are still spinning up. OFF indicates normal operation.

OK	Green	ON indicates normal operation.
Upgrade	Amber	ON while the CU operation is interrupted during a firmware upgrade.

Table 35: Typical Fan Tray LEDs

At power-on, the hot swap handle state is Closed. Pushing the Hot Swap button once toggles the handle state to Open. Pushing the Hot Swap button again toggles the handle state to Closed.
Removal of the Fan Tray is done via the captive screws.

3.5.2.5 Carrier Number Configuration

To set the Carrier number, set the Chassis Locator switch according to Table 4. The Chassis Locator switch is found on the front side of the VT856, as shown in Figure 54.

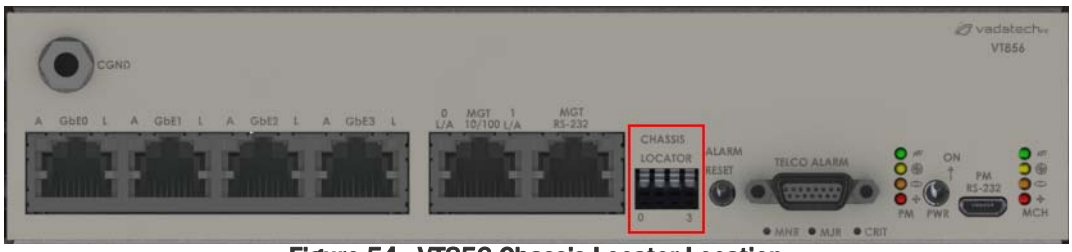

Figure 54: VT856 Chassis Locator Location

3.5.3 Power Module

This carrier includes an integrated MicroTCA PM. The PM gets its power from a single removable power supply, also called Power Entry Module or PEM. The PEM FRU Inventory is read when the power is first turned on to determine the PM power capability. Access to the PM is provided via the main front panel, as highlighted in Figure 55.

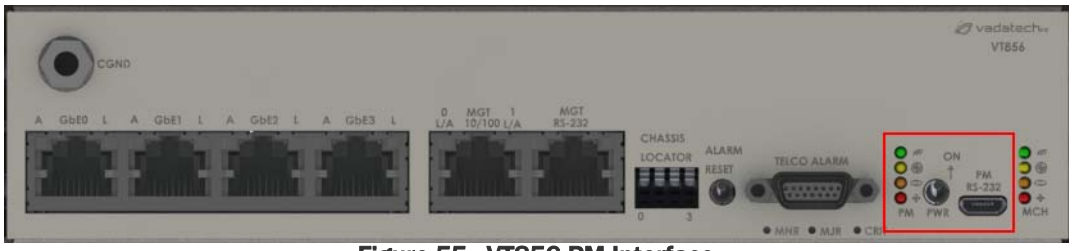

Figure 55: VT856 PM Interface

3.5.3.1 PWR Switch

In order for the system to run, the PWR switch must be in the “ON” position. The Power Switch directly controls the removable power supplies. When the switch is turned off, power is turned off to the entire Carrier, except for PM management power.

3.5.3.2 ATCA LEDs

The LEDs located on the main front panel to the right of the TELCO ALARM connector are standard ATCA-controlled LEDs.

- Blue: Hot-Swap, per MicroTCA. Note that the PM is not removable.
- Red: Fault. The PM cannot provide power to modules, per MicroTCA
- Green: Healthy. The PM can provide power.
- Amber: Upgrade. This LED goes on when the PM is out-of-service during a firmware upgrade.

3.5.3.3 Command Line Interface

The integrated PM implements a Command Line Interface (CLI) to provide power and temperature status independently of the MCH. Access to this interface is provided by the serial RS232 port on the main panel (PM RS-232). The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the carrier, part number CBL-DB9MUSB1. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81).

The common CLI provided by VadaTech MicroTCA Power Modules is described in the VadaTech MicroTCA Power Module Command Line Interface Reference Manual

3.5.3.4 Sensors

This PM provides the following sensors:

Number	Type	Name	Description
0x10	0x01	FET TEMP	Temperature around Input Choke
0x11	0x01	BRICK 1 TEMP	Temperature around Brick Output
0x12	0x01	BRICK 2 TEMP	Outgoing Air Temperature
0x13	0x01	856 PM tIN	Incoming Air Temperature
0x14	0x01	856 PM tOUT	Outgoing Air Temperature
0x28	0x02	856 PM 12V	12V DC Power Output
0x90	0xF2	PM HOT SWAP	AMC Hot Swap Handle
0x91	0xF1	IPMB LINK	ATCA IPMB-0 Status
0x94	0x08	PM STATUS	MicroTCA Power Module Status
0x95	0xF3	PM NOTIFICATION	MicroTCA Power Module Notification (Event-Only)
0x96	0x08	856 PM PWR IN	Input Power Redundancy

Table 36: PM Sensors

3.5.4 Telco Alarm Interface

3.5.4.1 Front Panel

The Telco Alarm Connector is used to relay alarm information to an external alarm device.

- The Critical (CRIT), Major (MJR), and Minor Alarm (MNR) LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be on.
- The ALARM RESET temporary switch is used to engage the Telco Cutoff, turning off the external Telco alarms. The alarm LEDs will not change, but the external alarm device, if any, will be turned off. The Telco Cutoff can be disengaged using the Carrier Manager or Shelf CLI. When disengaged, the external Telco alarms will turn back on.

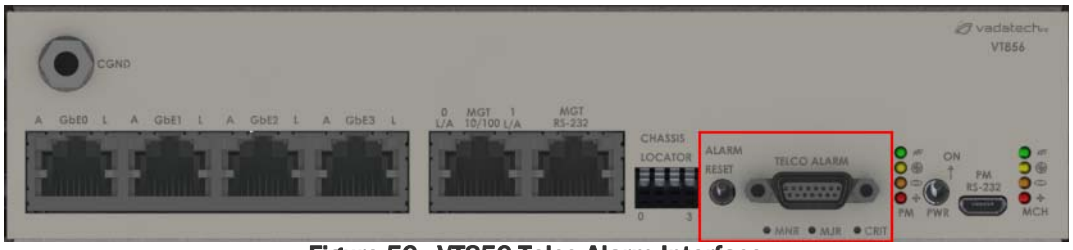

Figure 56: VT856 Telco Alarm Interface

3.5.5 Backplane Topology

The VT855 provides a dual-redundant IPMB-0 bus among the MCH, CU, and PM module. The IPMB-L bus is radial.

Port 0 and 1 of each AMC is routed to the on board GbE Fabric. In addition the un-managed GbE has four ports routed to the front and one port routed to the Management processor.

Figure 57: VT856 Fabric Topology for AMC Ports 0 and 1

Fabric clock (FCLK, 100Mhz HCSL) is routed directly from the clock generator to each AMC. The TCLKA and TCLKB are crossed and TCLKC and TCLKD are crossed.

Ports 2 and 3 are routed with the options in Table 37.

Ordering option (option C)	A1 slot Ports 2 and 3	B1 slot Ports 2 and 3
0	Direct connect to B1 slot (ports 2-3)	Direct connect to A1 slot (ports 2-3)
1	Port 2 to the second 2.5" disk (port 3 to B1)	Port 2 to the first 2.5" disk (port 3 to A1)
2	No connect on ports 2 and 3	Port 2 and 3 to the Dual 2.5" Disk

Table 37: VT856 Fabric Topology for AMC Ports 2 and 3

Ports 4 to 7 are routed with the options in the Table 38.

Ordering option (option D)	A1 slot Ports 4-7	B1 slot Ports 4-7
0	Direct connect to B1 slot (ports 4-7)	Direct connect to A1 slot (ports 4-7)
1	No connect on ports 4-7	Port 4 to the 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7)
2	No connect on ports 4-7	Port 4 to 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7). Dual independent disk
3	No connect on ports 4-7	Port 4 to 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7) Raid 0
4	No connect on ports 4-7	Port 4 to 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7). Raid 1
5	Port 4 to the second 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7)	Port 4 to the first 2.5" Disk via PCIe (Gen1 or Gen2) (no connect on ports 5-7)

Table 38: VT856 Fabric Topology for AMC Ports 4 to 7

Ports 8 to 11 and 17 to 20 are routed point to point between the two AMC slots.